PMSTPCOL PEmails

From: Mookhoek, William [wemookhoek@STPEGS.COM]
Sent: Thursday, July 10, 2008 10:16 PM
To: Gibson, Gregory T; George Wunder; Raj Anand; Rocky Foster; Tekia Govan; Tom Tai; Adrian Muniz; Belkys Sosa; STPCOL
Subject: RE: RESENT: RAI responses Report # ABR-AE-08000046
Attachments: STP34_ABR-AE-08000046.pdf

Tekia,
Please find attached a courtesy copy of the official correspondence sent to the NRC Document Control Desk by overnight delivery on June 26, 2008.
I understand that the NRC is not able to convert hard copy letters into usable electronic files for your use based on your telephone request to Mr. Gibson. I would like to opportunity to discuss this issue with you, why our formal hardcopy letter submittals do not adequately meet regulatory needs, and how we may assist the NRC with this issue. Please note that the formal correspondence included 3 DVD enclosures with calculation input files that are not included in this email.

Bill Mookhoek
Licensing Supervisor STP 3 & 4
wemookhoek@stpegs.com
office 361-972-7274
cell - 979-429-0384

-----Original Message-----
From: Gibson, Gregory T
Sent: Thursday, July 10, 2008 5:13 PM
To: Mookhoek, William
Subject: Fw: RESENT: RAI responses Report # ABR-AE-08000046

Please send - I'll call Reckley later. Thanks, Greg

----- Original Message -----
From: Tekia Govan <Tekia.Govan@nrc.gov>
To: Gibson, Gregory T
Cc: George Wunder <George.Wunder@nrc.gov>; Raj Anand <Raj.Anand@nrc.gov>; Rocky Foster <Rocky.Foster@nrc.gov>; Tekia Govan <Tekia.Govan@nrc.gov>; Tom Tai <Tom.Tai@nrc.gov>; Adrian Muniz <Adrian.Muniz@nrc.gov>; Belkys Sosa <Belkys.Sosa@nrc.gov>; STPCOL <STP.COL@nrc.gov>
Sent: Thu Jul 10 17:11:54 2008
Subject: RESENT: RAI responses Report # ABR-AE-08000046

First email contained incorrect address for Greg Gibson.

Greg,

Per our conversation, could you please send the pdf copy of the RAI response letter ABR-AE-08000046, dated June 26, 2008. Please respond to all so that Tom Tai (acting for George) may also get a copy.

For the future, to ensure that the workflow within our office remains consistent (especially during vacation and holiday seasons), we would like to request that you include all project managers from our branch on distribution when responding to RAIs. The list of project managers is listed below. If you have any questions or comments, please do not hesitate to contact us.

George.Wunder@nrc.gov

Raj.Anand@nrc.gov

Rocky.Foster@nrc.gov

Tekia.Govan@nrc.gov

Tom.Tai@nrc.gov

Adrian.Muniz@nrc.gov

Thanks

Tekia V. Govan, Project Manager

U.S. Nuclear Regulatory Commission

Office of New Reactors

MS T-7-F29

Washington DC 20555-0001

301-415-6197

Tekia.Govan@nrc.gov

Hearing Identifier: SouthTexas34Public_EX
Email Number: 152

Mail Envelope Properties (C5EF7C4EEB0C064EA742AF2F3691C39C04105E55)

Subject: RE: RESENT: RAI responses Report # ABR-AE-08000046
Sent Date: 7/10/2008 10:15:50 PM
Received Date: 7/10/2008 10:17:23 PM
From: Mookhoek, William

Created By: wemookhoek@STPEGS.COM

Recipients:
"Gibson, Gregory T" <gtgibson@STPEGS.COM>
Tracking Status: None
"George Wunder" <George.Wunder@nrc.gov>
Tracking Status: None
"Raj Anand" <Raj.Anand@nrc.gov>
Tracking Status: None
"Rocky Foster" <Rocky.Foster@nrc.gov>
Tracking Status: None
"Tekia Govan" <Tekia.Govan@nrc.gov>
Tracking Status: None
"Tom Tai" <Tom.Tai@nrc.gov>
Tracking Status: None
"Adrian Muniz" <Adrian.Muniz@nrc.gov>
Tracking Status: None
"Belkys Sosa" <Belkys.Sosa@nrc.gov>
Tracking Status: None
"STPCOL" <STP.COL@nrc.gov>
Tracking Status: None

Post Office: exgbe2.corp.stpegs.net

Files	**Size**	**Date & Time**
MESSAGE	2459	7/10/2008 10:17:23 PM
STP34_ABR-AE-08000046.pdf	2180419	

Options
Priority: Standard
Return Notification: No
Reply Requested: No
Sensitivity: Normal
Expiration Date:
Recipients Received:

Nuclear Operating Company

South Texas Project Electric Generating Station 4000 Avenue F – Suite A Bay City, Texas 77414

June 26, 2008
ABR-AE-08000046

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville MD 20852-2738

South Texas Project
Units 3 and 4
Docket Nos. 52-012 and 52-013
Response to Requests for Additional Information

Attached are responses to NRC staff questions included in Request for Additional Information (RAI) letter numbers 9, 10, 18, 34, 38, 39, 40, 41, 43, 45, 46, 47, 48, 49, 51 and 53 related to Combined License Application (COLA) Part 2, Tier 2 Sections 2.3S, 2.4S, 2.5S, 5.2, 9.1, and 11.4. This submittal includes responses to the following Question numbers:

02.03.01-8	02.04.05-1	02.05.01-5	05.02.05-1	09.01.04-1	11.04-1
02.03.01-9	02.04.11-1	02.05.03-4	05.02.05-2	09.01.04-2	11.04-2
02.03.02-4	02.04.12-19		05.02.05-3	09.01.04-3	
02.03.03-2	02.04.13-2		05.02.05-4	09.01.04-4	
	02.04.13-5			09.01.04-5	
	02.04.13-7				
	02.04.14-2				

Enclosures 1, 2 and 3 are provided as referenced in Attachments 4, 5, and 10, respectively.

When a change to the COLA is indicated by a question response, the change will be incorporated into the next routine revision of the COLA following NRC acceptance of the question response.

There are no new commitments made in this letter.

If you have any questions regarding the attached responses, please contact me at (361) 972-7206, or Greg Gibson at (361)-972-4626.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 6-26-08

Mark A. McBurnett
Vice President, Oversight and Regulatory Affairs
South Texas Project, Units 3 & 4

fjp

Enclosures:
1. DVD- Humidity-Temp Data (Question 02.03.03-2)
2. DVD- Letter #25425-000-TCM-GEG-00010 (Question 02.04.05-1)
3. Attachment H, Kd Test Results, Consists of: SRNL Report Dated September 20, 2007 (Question 02.04.13-7)

Attachments:
1. Question 02.03.01-8
2. Question 02.03.01-9
3. Question 02.03.02-4
4. Question 02.03.03-2
5. Question 02.04.05-1
6. Question 02.04.11-1
7. Question 02.04.12-19
8. Question 02.04.13-2
9. Question 02.04.13-5
10. Question 02.04.13-7
11. Question 02.04.14-2
12. Question 02.05.01-5
13. Question 02.05.03-4
14. Question 05.02.05-1
15. Question 05.02.05-2
16. Question 05.02.05-3
17. Question 05.02.05-4
18. Question 09.01.04-1
19. Question 09.01.04-2
20. Question 09.01.04-3
21. Question 09.01.04-4
22. Question 09.01.04-5
23. Question 11.04-1
24. Question 11.04-2

cc: w/o attachment except*

(paper copy)

Director, Office of New Reactors
U. S. Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738

Regional Administrator, Region IV
U. S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 400
Arlington, Texas 76011-8064

Richard A. Ratliff
Bureau of Radiation Control
Texas Department of State Health Services
1100 West 49th Street
Austin, TX 78756-3189

C. M. Canady
City of Austin
Electric Utility Department
721 Barton Springs Road
Austin, TX 78704

*Steven P. Frantz, Esquire
A. H. Gutterman, Esquire
Morgan, Lewis & Bockius LLP
1111 Pennsylvania Ave. NW
Washington D.C. 20004

*George F. Wunder
Two White Flint North
11545 Rockville Pike
Rockville, MD 20852

*Raj Anand
Two White Flint North
11545 Rockville Pike
Rockville, MD 20852

(electronic copy)

A. H. Gutterman, Esquire
Morgan, Lewis & Bockius LLP

Loren R. Plisco
U. S. Nuclear Regulatory Commission

Brad Porlier
Steve Winn
Eddy Daniels
NRG South Texas 3/4 LLC

Jon C. Wood, Esquire
Cox Smith Matthews

J. J. Nesrsta
R. K. Temple
Kevin Pollo
L. D. Blaylock
CPS Energy

Question 02.03.01-8

QUESTION:

Both FSAR Sections 2.3S1.1 and 2.3S.2.1 state that long-term data from Victoria were used to describe the general climatic conditions at the STP site; FSAR Section 2.3S.2.1 also states that Victoria data were used to describe the site extreme climatology. FSAR Section 2.3S.2.1 further states that the monthly mean daily maximum and minimum temperatures are more extreme at Victoria compared to those measured at Palacios; therefore, Victoria data were used to describe the site extreme climatology. However, the staff notes that Victoria is located significantly further from the Gulf of Mexico as compared to either Palacios or the STP site and the climatic data tables associated with Chapter 28 of the 2005 ASHRAE Handbook – Fundamentals show that the Palacios 0.4%, 1%, and 2% exceedance wet-bulb values exceed the corresponding Victoria wetbulb values by approximately 1 °C. FSAR Section 2.3S.2.1 states that consecutive hourly data are not available at Palacios during the period of March 1959 through December 1999. However, the staff was able to download 1988–2007 Palacios hourly data from the National Climatic Data Center (NCDC) Climate Data website. FSAR Section 2.3S.3.4.1.4 further states that Palacios is considered to be representative of the STP site and data collected at Palacios from 1997 through 2001 were used to predict cooling tower plume impacts resulting from operation of the STP 3 and 4 reactor service water mechanical draft cooling towers.

(a) Justify not including meteorological data from Palacios in the selection of the minimum water cooling and maximum water usage conditions for use in evaluating the ultimate heat sink thermal performance as discussed in FSAR Section 2.3S.1.4.

(b) Justify not including meteorological data from Palacios in the selection of the 0% exceedance coincident and non-coincident wet bulb temperatures and the 100-year return period maximum wet-bulb temperature ambient design temperature site characteristics as discussed in FSAR Section 2.3S.1.5.

RESPONSE:

The UHS design described in Revision 1 of the STP 3 & 4 COLA is being modified. The following RAI response applies to the UHS design as currently described in COLA Revision 1. This response will be updated, if necessary, following completion of the UHS design modification, which will be presented in the next revision of the COLA.

The following responds to part (a):

(a) Palacios meteorological data was not used in the selection of the minimum water cooling or maximum water usage conditions in evaluating the ultimate heat sink thermal performance as discussed in FSAR Section 2.3S.1.4 because 30 years of recent representative data, as identified in Regulatory Guide 1.27, was not available. Victoria data, based on proximity to the site as discussed in FSAR Section 2.3S.2.1 and the availability of greater than 30 years of data, was therefore considered as the

representative regional climatology. An evaluation has been performed using an 18-year period of sequential data for Palacios, Texas, obtained from the National Climactic Data Center (1988 to 2005 in raw or text delimited TD-3505 or raw DS-3505 format) for comparison to the UHS performance using the Victoria data. The 18 year period chosen for this comparison represents that which would have been applicable at the time the UHS performance was evaluated. The evaluation demonstrates that water usage would be bounded by the analysis results using the Victoria data; and the UHS maximum water temperature, although slightly higher (less than 0.3 °C) than with the Victoria data, would remain below the design limit cold water temperature of 35 °C (95 °F). Thus the use of Victoria data is considered reasonable. FSAR Subsections 2.3S.1.4 and 9.2.5.5 will be revised to provide a summary of the effects of the use of the Palacios data on UHS performance.

The following responds to part (b):

(b) In order to analyze wet bulb related climatological parameters, twenty years (1988-2007) of hourly meteorological data collected at Palacios Municipal Airport were obtained from the National Climatic Data Center.

Wet bulb temperatures are not available from Palacios. However, hourly wet bulb temperatures were estimated based on hourly dry bulb, dew point temperatures, and the station atmospheric pressure (Ref. 1). According to the 20-year (1998-2007) data set (Refs 2 through 9), the maximum (0% exceedance) coincident and non-coincident wet bulb temperatures are 77.8^{o}F and 86.1^{o}F, respectively. The 0% exceedance coincident wet bulb temperature (77.8^{o}F) is associated with a maximum dry bulb temperature of 106°F which occurred in Year 2000. Additionally, using a linear regression (least squares) method, the 100-year return period maximum wet bulb temperature was estimated to be 88.3^{o}F. This value is slightly higher than the Victoria 100-year return period maximum wet bulb temperature of 86.1^{o}F as reported in Section 2.3S.1.5 of the FSAR. This is expected as Palacios is located closer to the Gulf of Mexico than Victoria.

Because the 2.5% increase in the 100-year return maximum wet bulb temperature is a slight amount, the Palacios data were not used in the COLA. Furthermore, the maximum non-coincident wet bulb temperatures at Palacios and Victoria are 86.1^{o}F and 84.4^{o}F, respectively. The use of the Palacios data for this parameter will result in a slight 2% increase as well. As a result, Palacios data were not included in the COLA for these parameters.

References:

1. Reference Manual, WBAN Hourly Surface Observations 144, National Climatic Data Center, Revised, November 1970.

2. National Climatic Data Center, Integrated Surface Hourly Data, 1995-99, CD-ROM, Volume 8, Central United States of America, NCDC, NESDIS, NOAA, September 2002.

3. National Climatic Data Center, Integrated Surface Hourly Observations, 2000, CD-ROM, Volume 15, United States of America, NCDC, NESDIS, NOAA, September 2002.

4. National Climatic Data Center, Integrated Surface Hourly Observations, 2001, CD-ROM, Volume 19, United States of America, NCDC, NESDIS, NOAA, January 2003.

5. National Climatic Data Center, Integrated Surface Hourly Observations, 2002, CD-ROM, Volume 23, United States of America, NCDC, NESDIS, NOAA, August 2003.

6. National Climatic Data Center, Integrated Surface Hourly Observations, 2003, DVD-ROM, Global Data Set, United States of America, NCDC, NESDIS, NOAA, October 2004.

7. National Climatic Data Center, Integrated Surface Hourly Observations, 2004, DVD-ROM, Global Data Set, United States of America, NCDC, NESDIS, NOAA, June 2005.

8. National Climatic Data Center, Integrated Surface Hourly Observations, 2005, DVD-ROM, Global Data Set, United States of America, NCDC, NESDIS, NOAA, August 2006.

9. National Climatic Data Center, Quality Controlled Local Climatological Data, 1988-1994, 2006 and 2007, http://cdo.ncdc.noaa.gov/qclcd/QCLCD, Accessed 4/24/2008.

COLA changes for part (a):

The following will be added as the fourth paragraph of FSAR Subsection 2.3S.1.4:

> An evaluation was also performed using a recent 18-year period of sequential data for Palacios, Texas, to determine the effect on UHS performance for comparison to performance using the Victoria data. The results of the evaluation are discussed in Subsection 9.2.5.5.

The following will be added to the end of the paragraph in Subsection 9.2.5.5.1, Design Meteorology.

> For comparison to the use of the Victoria data, 18 years of recent meteorological data for (1988 to 2005) Palacios, Texas, obtained from the National Climactic Data Center was evaluated. Results using this limited number of years of Palacios data demonstrated that water usage is bounded by the analysis results using the Victoria data and the UHS maximum water temperature, although slightly higher than with the Victoria data, would remain below the design limit cold water temperature of 35 °C (95 °F).

Question 02.03.01-9

QUESTION:

Clarify the definition of the ambient design temperature site parameters discussed in FSAR Section 2.3S.1.5 and listed in ABWR DCD Tier 1 Table 5.0 and Tier 2 Table 2.0-1. For example, do the 1% exceedance values represent annual or seasonal probabilities of occurrence? Do the coincident wet-bulb values represent mean or extreme values?

RESPONSE:

The DCD listed values for Wet Bulb temperatures are defined slightly different from that intended for COLA section 02.03.01. The source of the criteria for these definitions, however, is the same (American Society of Heating, Refrigerating, and Air Conditioning Engineers [ASHRAE] Handbook of Fundamentals) which have been used for all vintages of nuclear plants.

It is important to recognize that the selection of certain parameters depends on the application. For designing devices that are more impacted by the moisture content in the air rather than the dry temperature, the maximum (non-coincident) Wet Bulb temperature values are used (Example; cooling tower and cooling reservoirs). On the other hand if the devices are impacted by both dry temperature and moisture content, then both Dry Bulb and simultaneous Wet Bulb (coincident) values are used (Example; HVAC systems cooling design).

It is also pertinent to recognize the difference/ impact of the terms Wet Bulb and Dry Bulb. The impact from Wet Bulb temperatures stems from the moisture content in the ambient which depends on the rate of water evaporation for which averaging it over time provides a more meaningful method on systems/ equipments sizing (as compared to using the highest recorded values).

Recognizing the above weather characteristic, ASHREA guidance for the Wet Bulb temperatures has evolved from the 70's to 2000's to provide more reliable data to the users.

In the 70's and 80's (the DCD era), ASHRAE listed ambient temperature values, simply, as Design Dry Bulb, Design Wet Bulb. ASHRAE emphasized that all data presented are based on the average number of hours (which varies for each % Exceedance criteria selected) at or above a given design value over a period of several seasons.

In the latest 2005 ASHRAE Handbook publication, the result of a research project initiated by ASHRAE, (project # RP-1273, ASHRAE 2004a) was used and a new definition for Wet Bulb temperature usage was devised. ASHRAE made available three Dry Bulb/ Wet Bulb/ Dew- Point combinations to choose from and allows the designer to consider various operational peak conditions; Dry Bulb with Mean Coincident Wet-Bulb (MCWB), Wet- Bulb with Mean Coincident Dry- Bulb temperature, and Dew- Point with mean coincident Dry- Bulb temperature and corresponding Humidity Ratio.

In COLA section 2.3S.1.5, the first combination (Dry- Bulb with MCWB), was used. This combination is the only data posted in ASHRAE for Palacios and Victoria, estimated from 30 years (1971 – 2000) of meteorological data.

As shown in the Table below, there is a minor difference between the old DCD values and the most recent 2005 ASHRAE values used in the COLA.

Since the 2005 ASHRAE values are based on a longer period of observation/ data collection, it is believed that these data provide more reliable basis for the design.

Summary of Maximum Temperature Listing (1% Exceedance)

DCD Tier 1, Table 5.0 COLA Tier 1, Table 5.0	Maximum Dry Bulb 37.8°C Maximum Dry Bulb 37.8°C	Coincident Wet Bulb 25°C Coincident Wet Bulb 26.3°C	Non-Coincident Wet Bulb 26.7°C Non-Coincident Wet Bulb 27.3°C
DCD Tier 2, Table 2.0-1 COLA Tier 1, Table 2.0-1	Maximum Dry Bulb 37.8°C Maximum Dry Bulb 32.8°C	Coincident Wet Bulb 25°C Coincident Wet Bulb 26.3°C	Non-Coincident Wet Bulb 26.7°C Non-Coincident Wet Bulb 27.3°C
COLA Tier 2, Table 2.3S.1.5**	Maximum Dry Bulb 32.8°C	Mean Coincident Wet Bulb 26.3°C	Non-Coincident Wet Bulb 27.3°C

** (There is no corresponding section in the DCD as it addresses site specific design)

No COLA revision is required as a result of this RAI response.

Question 02.03.02-4

QUESTION:

Both FSAR Sections 2.3S1.1 and 2.3S.2.1 state that long-term data from Victoria were used to describe the general climatic conditions at the STP site; FSAR Section 2.3S.2.1 also states that Victoria data were used to describe the site extreme climatology. FSAR Section 2.3S.2.1 further states that the monthly mean daily maximum and minimum temperatures are more extreme at Victoria compared to those measured at Palacios; therefore, Victoria data were used to describe the site extreme climatology. However, the staff notes that Victoria is located significantly further from the Gulf of Mexico as compared to either Palacios or the STP site and the climatic data tables associated with Chapter 28 of the 2005 ASHRAE Handbook – Fundamentals show that the Palacios 0.4%, 1%, and 2% exceedance wet-bulb values exceed the corresponding Victoria wet-bulb values by approximately 1 °C. FSAR Section 2.3S.2.1 states that consecutive hourly data are not available at Palacios during the period of March 1959 through December 1999. However, the staff was able to download 1988–2007 Palacios hourly data from the National Climatic Data Center (NCDC) Climate Data website. FSAR Section 2.3S.3.4.1.4 further states that Palacios is considered to be representative of the STP site and data collected at Palacios from 1997 through 2001 were used to predict cooling tower plume impacts resulting from operation of the STP 3 and 4 reactor service water mechanical draft cooling towers.

(a) Justify not including meteorological data from Palacios in the review of average wind direction and wind speed conditions as discussed in FSAR Section 2.3S.2.2.1.
(b) Justify not including meteorological data from Palacios in the review of atmospheric vapor as discussed in FSAR Section 2.3S.2.2.5.
(c) Justify not including meteorological data from Palacios in the review of fog in FSAR Section 2.3S.2.2.6.

RESPONSE:

(a) A 5-year period (i.e., 1995 through 1999) of wind measurements from the cooperative observing station at the Palacios Municipal Airport (Reference 1) has been evaluated. Longstanding U.S. EPA guidance has determined that for dispersion-related analyses, variations over a 5-year period of record are representative of longer duration data sets. Wind roses based on this data set for Palacios (Figures 1 through 5) show reasonably similar characteristics in predominant directions on an annual basis when compared to the onsite annual wind rose (see Figure 2.3S-2) (i.e., from the southeast through south sectors) and as indicated in the 2005 Local Climatological Data (LCD) summary for the Victoria National Weather Service (NWS) station (see Table 2.3S-2) (i.e., a prevailing direction of 160° or from the south-southeast sector).

At both locations, reasonably similar variations in the predominant wind direction sectors over the course of the year are also evident in the onsite seasonal wind roses (see Figures 2.3S-3 to 2.3S-6) and the seasonal wind roses for Palacios. Winter is characterized by a

noticeably bimodal directional distribution including a predominant northerly component along with a significant frequency of winds from the southeast quadrant. During the spring and summer, winds from the southeast quadrant dominate, shifting to a prevailing southerly component over time. The autumn transitional season shows a broad distribution of wind frequencies throughout all of the northeast and southeast quadrants, with the least-frequent winds from the westerly direction. Although not summarized in the same manner, the monthly prevailing wind directions in the Victoria LCD (see Table 2.3S-2) exhibit much the same variation during the year.

Mean wind speeds at Palacios for the 5-year period from 1995 through 1999 are similar, although somewhat higher, throughout the year compared to the lower-level, seasonal and annual wind speeds at the STP site and the Victoria NWS station as summarized in Table 2.3S-6. Mean wind speeds are higher by less than 1.0 m/sec on an annual basis, ranging from 0.4 to 1.3 m/sec higher depending on season and measurement location.

Specific differences in directional frequencies and mean wind speeds may be due to station siting and instrumentation, and to different periods of record among the three stations. Nevertheless, the wind direction and wind speed data show reasonable intermediate-field (Palacios) and far-field (Victoria) similarity to the wind conditions measured at the STP site.

(b) In order to determine the 100-year return period wet bulb temperature, a long-term meteorological data is required. As a result, 20 years (1988-2007) of continuous hourly Palacios meteorological data were obtained from National Climatic Data Center. Using a linear regression (least squares) method, the 100-year return of the Palacios maximum wet bulb temperature was estimated to be 88.3^{o}F. Based on the same data set, the maximum (0% exceedance) coincident and non-coincident wet bulb temperatures are 83°F and 86.1^{o}F, respectively.

The mean annual wet bulb temperature is 66.3^{o}F at Palacios (References 1- 7 & 11). This is slightly higher than that found at Victoria (64.5^{o}F) (Reference 12). The slight increase in wet bulb temperature is expected as Palacios is located closer to the Gulf of Mexico than Victoria. The 20-year database shows the mean annual dew point temperature is 63.2^{o}F at Palacios (References 1-7 & 11). As expected, this value is also slightly higher than that measured at Victoria (60.9^{o}F) (Reference 12).

The Palacios 20-year annual average relative humidity is 80% (References 1-7 & 11). Because the proximity to the Gulf of Mexico, it is higher than that found at Victoria (76%) (Reference 12).

(c) The cooperative observing station at the Palacios Municipal Airport is not a first-order NWS station. As a result, the length of a readily available, historical record for certain weather elements (in this case, heavy fog conditions) for Palacios is not as long nor as complete as that available from the Victoria, Texas NWS station.

An Automated Surface Observation System (ASOS), implemented by the NWS at Palacios through the Federal Aviation Administration, was installed in late 2000. Observations of fog conditions have been routinely archived at the Palacios Municipal Airport since that time (Reference 9). The data base available for the Victoria NWS station (see Table 2.3S-2) covers a 28-year period of record.

The average annual frequency of heavy fog conditions at Palacios is about 29 days per year based on the 7-year period of record from 2001 to 2007 (Reference 8) whereas at Victoria heavy fog occurs about 42 days per year (see Table 2.3S-2). The monthly and seasonal variation, as discussed in FSAR Subsection 2.3S.2.2.7 for the Victoria NWS station, is similar at Palacios.

The difference in frequencies of occurrence between the two locations may be due to the periods of record being quite different. While it is noted that this relative difference in annual frequencies is consistent with the Climate Atlas of the United States (Reference 10), it is also noted that the higher frequency of occurrence shown in the plot of annual frequencies that includes the STP site area probably reflects the location-specific observations at Victoria and that station coverage is not as great as the contours imply. Given the size of the Main Cooling Reservoir at the STP site and its proximity to STP Units 3 & 4, the frequency of heavy fog conditions for the Victoria NWS station is still considered to be a reasonable indicator of the conditions that may be expected to occur at the STP site.

References

1. National Climatic Data Center, Integrated Surface Hourly Data, 1995-99, CD-ROM, Volume 8, Central United States of America, NCDC, NESDIS, NOAA, September 2002.

2. National Climatic Data Center, Integrated Surface Hourly Observations, 2000, CD-ROM, Volume 15, United States of America, NCDC, NESDIS, NOAA, September 2002.

3. National Climatic Data Center, Integrated Surface Hourly Observations, 2001, CD-ROM, Volume 19, United States of America, NCDC, NESDIS, NOAA, January 2003.

4. National Climatic Data Center, Integrated Surface Hourly Observations, 2002, CD-ROM, Volume 23, United States of America, NCDC, NESDIS, NOAA, August 2003.

5. National Climatic Data Center, Integrated Surface Hourly Observations, 2003, DVD-ROM, Global Data Set, United States of America, NCDC, NESDIS, NOAA, October 2004.

6. National Climatic Data Center, Integrated Surface Hourly Observations, 2004, DVD-ROM, Global Data Set, United States of America, NCDC, NESDIS, NOAA, June 2005.

7. National Climatic Data Center, Integrated Surface Hourly Observations, 2005, DVD-ROM, Global Data Set, United States of America, NCDC, NESDIS, NOAA, August 2006.

8. Palacios Municipal Airport, Annual Climatological Summary, 2001-2007, National Climatic Data Center.

9. Palacios Municipal Airport, Local Climatological Data, 2001-2007, National Climatic Data Center.

10. "The Climatic Atlas of the United States," NCDC, Version 2.0 (CD-ROM), NCDC, Climate Services Division, NOAA, September 2002.

11. National Climatic Data Center, Quality Controlled Local Climatological Data, 1988-1994, 2006 and 2007, http://cdo.ncdc.noaa.gov/qclcd/QCLCD, Accessed 4/24/2008.

12. 2005 Local Climatological Data, Annual Summary with Comparative Data, Victoria, Texas, National Climatological Data Center, NESDIS, NOAA, 2006.

FIGURE 1 Palacios Annual Wind Rose

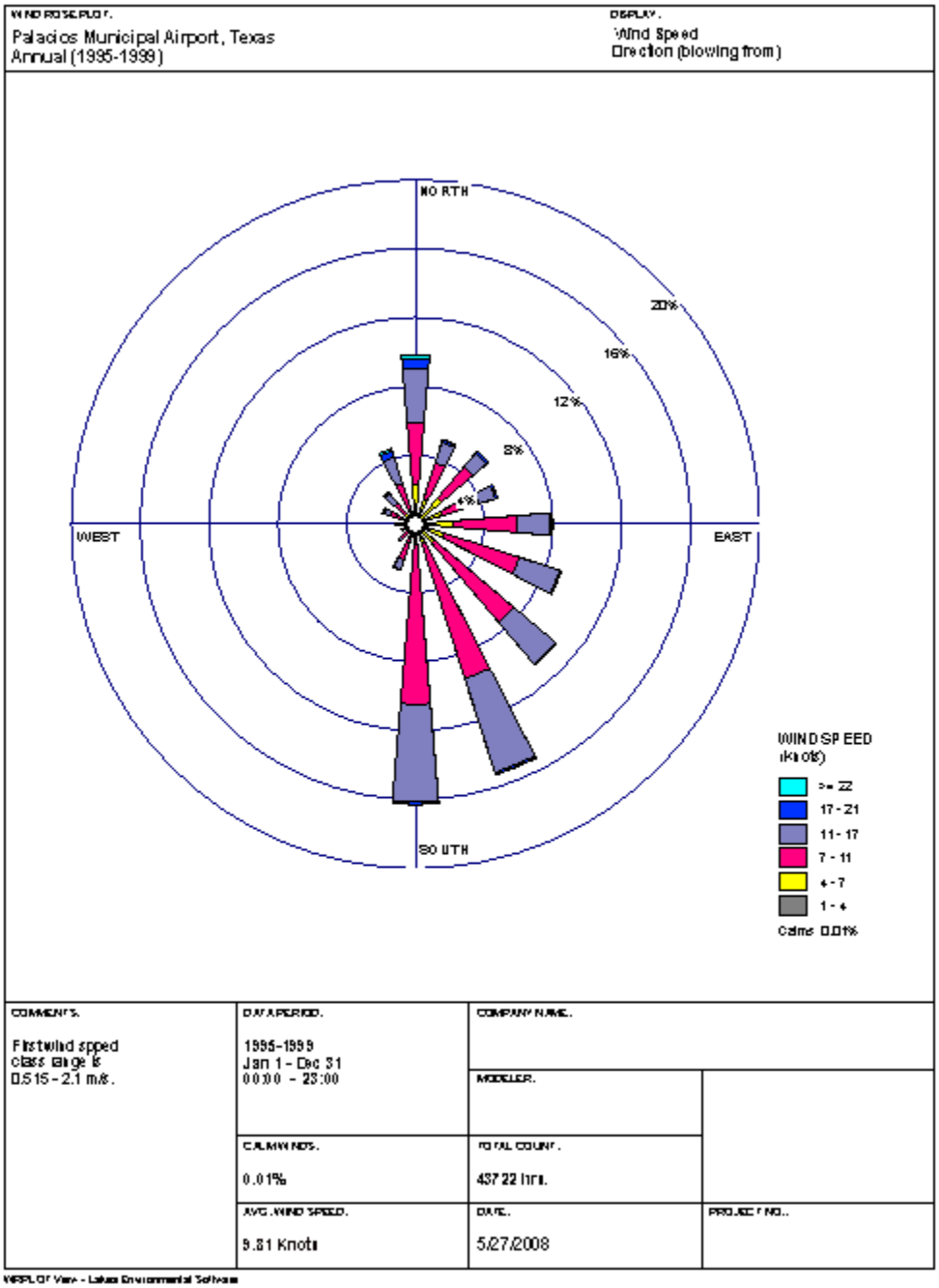


FIGURE 2 Palacios Winter Season Wind Rose

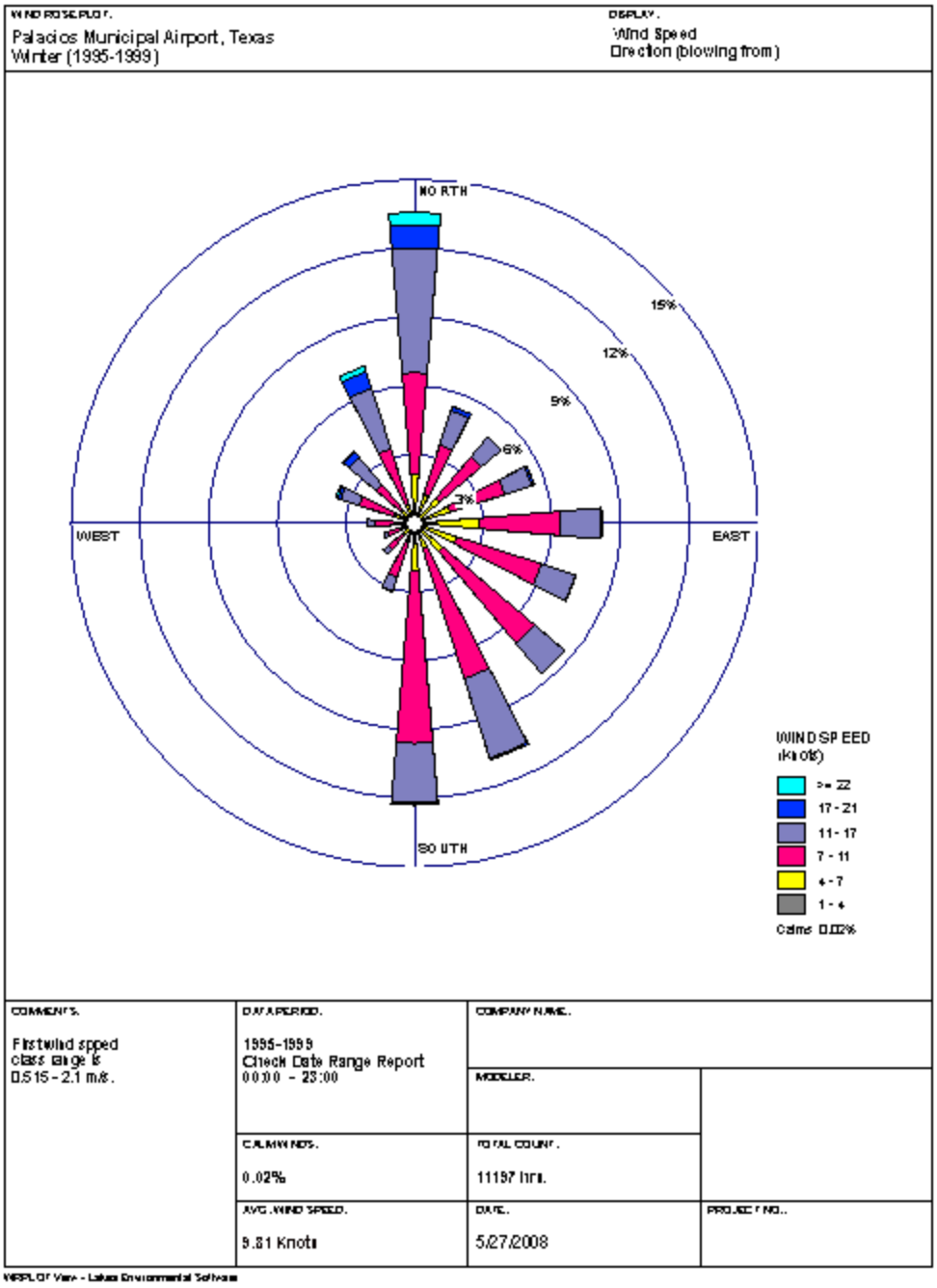


FIGURE 3 Palacios Spring Season Wind Rose

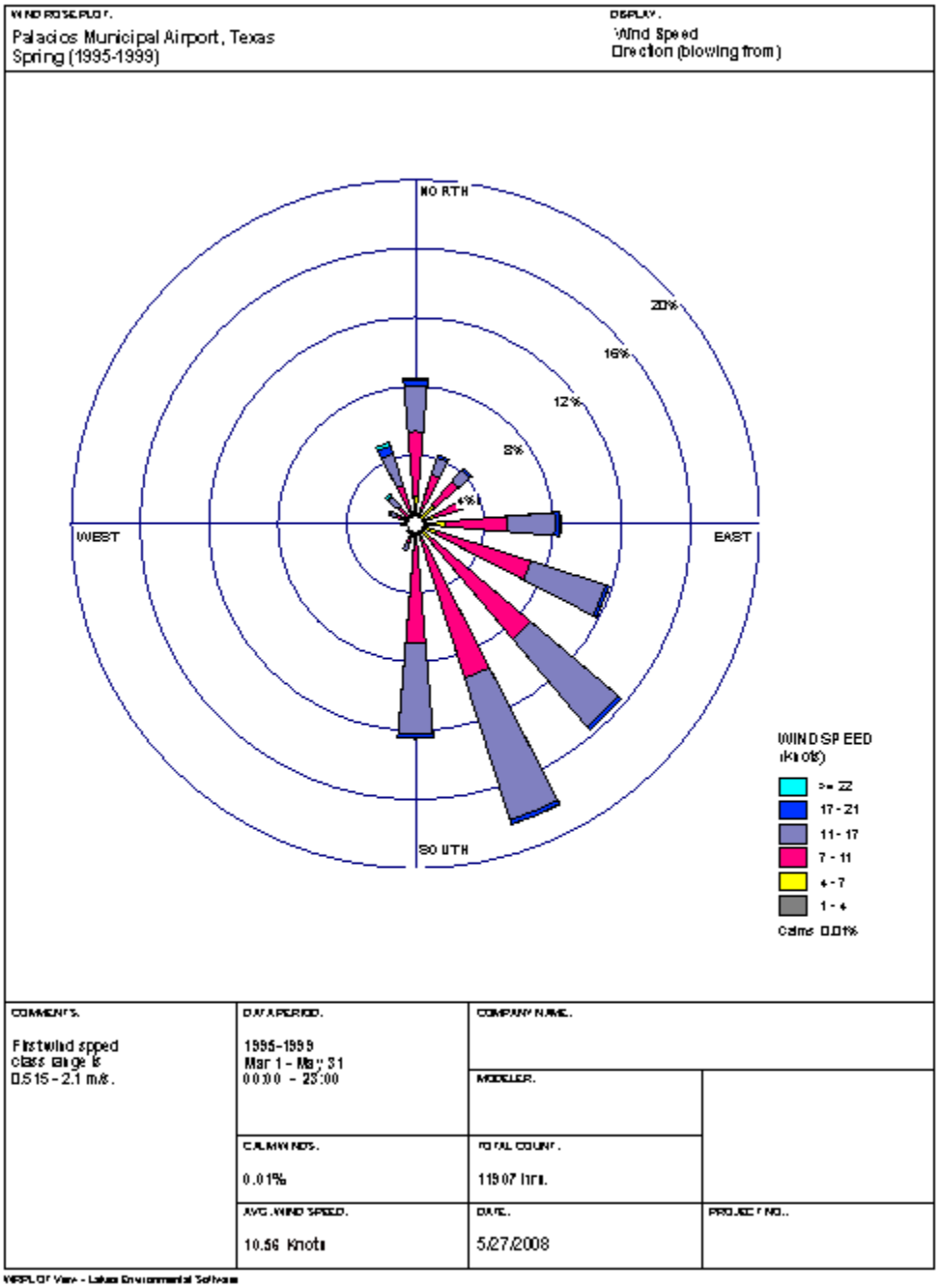


FIGURE 4 Palacios Summer Season Wind Rose

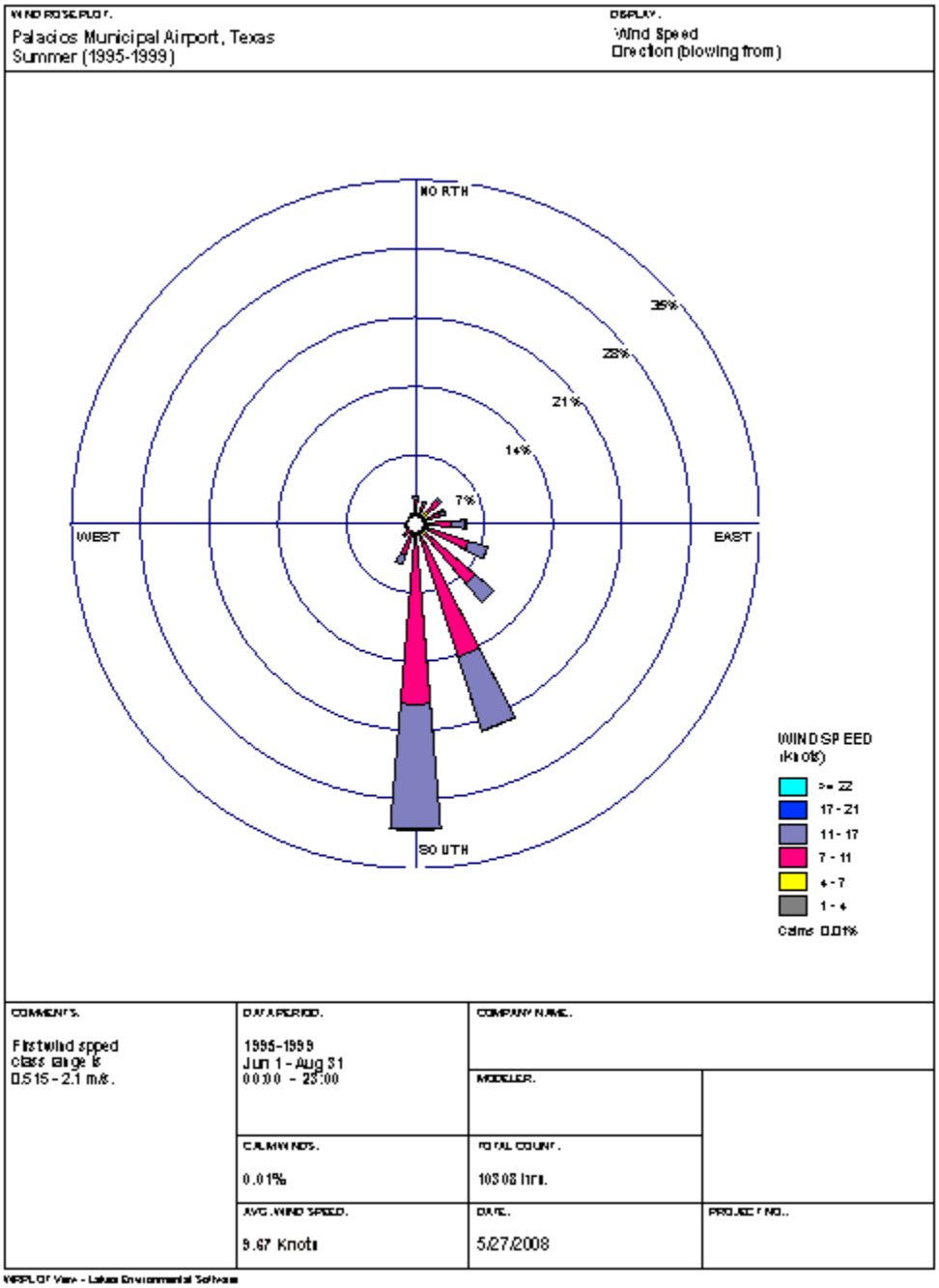
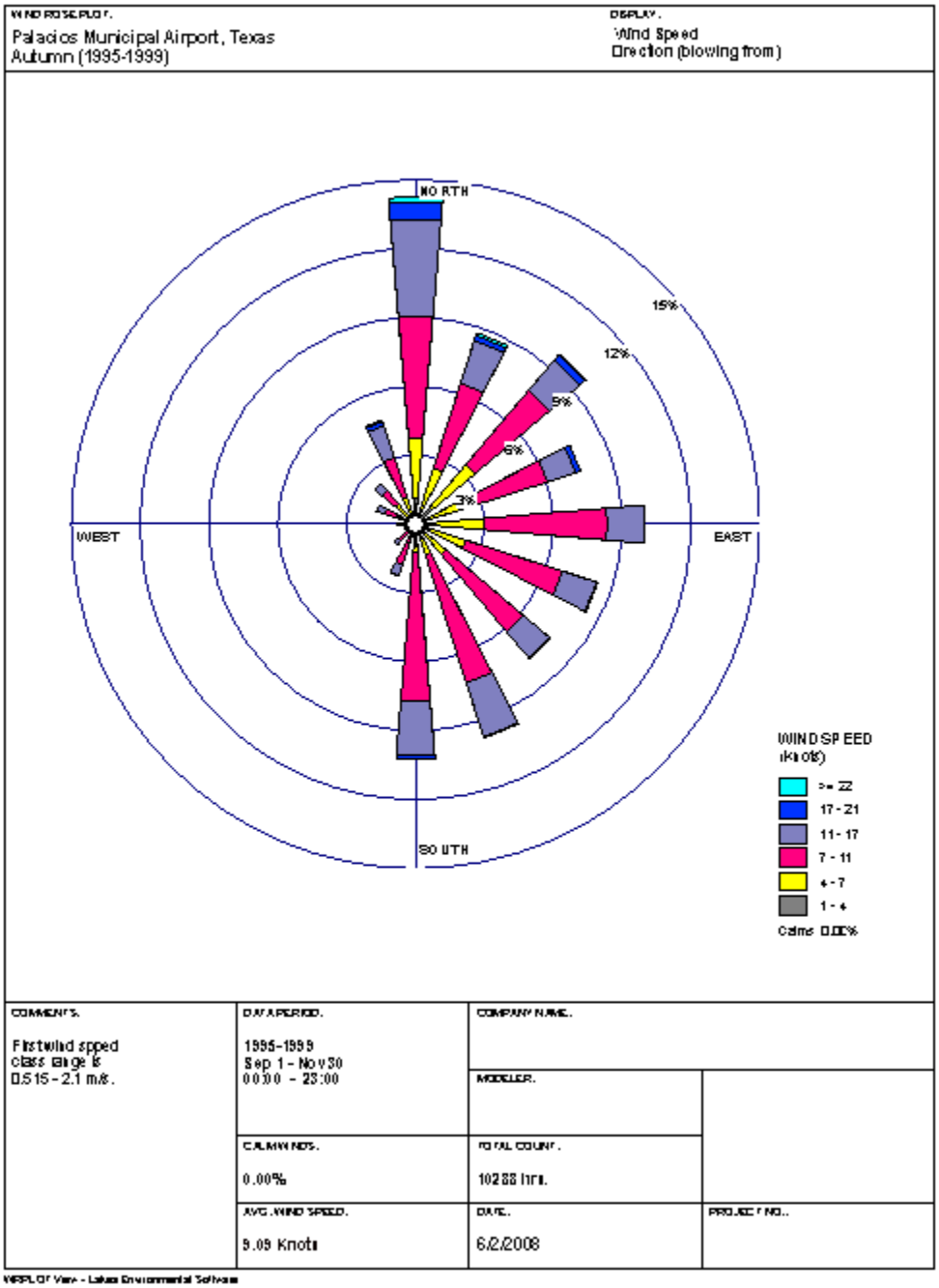


FIGURE 5 Palacios Autumn Season Wind Rose



The second paragraph of FSAR section 2.3S.2.2.1 will be revised as follows:

> Site-specific or micro-scale (i.e., 2 km or less) wind conditions, while they may reflect these larger-scale circulation effects, are ~~generally~~ influenced primarily by local and, generally, to a lesser extent, by meso- or regional-scale (i.e., up to about 200 km) topographic features. Wind measurements at these smaller scales are currently available from the meteorological monitoring program operated in support of STP 1 & 2 and from long-term data recorded at the nearby Victoria, Texas NWS station and shorter-term measurements at the cooperative observation station at Palacios Municipal Airport. Subsection 2.3S.3.3 presents a summary description of the STP onsite monitoring program. In its current configuration, wind direction and wind speed measurements are made at two levels (10-m and 60-m) on an instrumented 60-m guyed tower.

The seventh paragraph of FSAR section 2.3S.2.2.1 will be revised as follows:

> Wind information summarized in the Local Climatological Data (LCD) for the Victoria, Texas NWS station (Table 2.3S-2) over a 25-year period of record indicates a prevailing south-southeasterly wind direction (Reference 2.3S-1) that appears to be similar to the 10-m level wind flow at the STP site, at least on an annual basis (see Figure 2.3S-2). The monthly variation of prevailing wind directions for the Victoria station follows a similar pattern from March through August and November and December, but differs during September**,** October, January and February. However, the variations for the months of September, October, January and February are most likely due to the much shorter period of record for the STP meteorological data, as compared to Victoria station (Reference 2.3S-1).

The following paragraph will be inserted following paragraph 7:

> Based on the 5-year period of record from 1995 through 1999, wind direction measurements from the cooperative observing station at the Palacios Municipal Airport (Reference 2.3S-27) show reasonably similar characteristics in predominant directions on an annual basis. At both locations, reasonably similar variations in the predominant wind direction sectors over the course of the year are also evident.

The following paragraph will be inserted following paragraph 9 which begins:

"On an annual basis, mean wind speeds at the 10- and 60-meter levels are…

> Mean wind speeds at Palacios for the 5-year period from 1995 through 1999 are similar, although somewhat higher, throughout the year compared to the lower-

level, seasonal and annual wind speeds at the STP site and the Victoria NWS station as summarized in Table 2.3S-6. Mean wind speeds are higher by less than 1.0 m/sec on an annual basis, ranging from 0.4 to 1.3 m/sec higher depending on season and measurement location.

Specific differences in directional frequencies and mean wind speeds may be due to station siting and instrumentation, and to different periods of record among the three stations. Nevertheless, the wind direction and wind speed data show reasonable intermediate-field (Palacios) and far-field (Victoria) similarity to the wind conditions measured at the STP site.

FSAR section 2.3S.6 References will be changed as follows:

2.3S-27 ~~Climate-Radar Data Inventory, 1280-Surface Airway Hourly and Airway Solar Radiation Inventory Holdings, Palacios, TX, http:// http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwDI~Dataset Search~3280~12935~20024269, accessed on June, 4 2007.~~
National Climatic Data Center, Integrated Surface Hourly Data, 1995-1999, CD-ROM, Volume 8, Central United States of America, NCDC, NESDIS, NOAA, September 2002.

Question 02.03.03-2

QUESTION:

FSAR Section 2.3S.3.2.1.2 states that additional relative humidity/temperature instrumentation were added to the primary meteorological monitoring tower in 2006 to baseline moisture content in the environment for a range of mechanical draft cooling towers to be considered for STP 3 & 4. Please provide a copy of the resulting database once a contiguous year of data has been collected and compare these data to the data used to evaluate cooling tower plume impacts as discussed in FSAR Section 2.3S3.4.1.4.

RESPONSE:

The UHS system described in Revision 1 of the STP 3 & 4 COLA is being modified. The following RAI response applies to the UHS system as currently described in COLA Revision 1. This RAI response will be updated, if necessary, following completion of the UHS system modification, which will be presented in the next revision of the COLA.

Following the addition of relative humidity/temperature instrumentation in December 2006, the STP meteorological data collected onsite was augmented with the measurement of dew point temperature during 2007. STP began collecting the site specific dew point temperature and subsequently a year of data has been collected. A copy of this data is provided in a DVD as an attachment to this letter. This data was compared to the dew point temperature data purchased from the National Climatic Data Center for the Palacios Municipal Airport National Weather Service (NWS) Station. The STP site measured dew point temperature ranged from 13°F to 80°F during 2007, while the NWS dew point temperature ranged from 19°F to 84°F during the year 1997, 9°F to 81°F during the year 1999, and 10°F to 81°F during the year 2000. An annual and monthly comparison of temperature ranges are presented in Table 1. As shown in Table 1 in the attached DVD, the NWS dew point temperature data purchased for the Palacios Municipal Airport NWS Station are generally consistent with the STP site measured dew point temperature data ranges.

No COLA revision is required as a result of this RAI response.

Question 02.04.05-1

QUESTION:

(a) Provide the SURGE code and supporting input and output files used to estimate the probable maximum storm surge (PMSS) at the coast near Matagorda, Texas. (b) Provide the input and output files of the HEC-RAS application used to estimate backwater effects corresponding to PMSS values obtained from the SURGE model.

RESPONSE:

For part (a), Microsoft Excel (XL) files, including Visual Basic for Applications (VBA) macros, are provided in the enclosed CD in the subdirectory named "RAI 34 - SURGE" for the four scenarios in "STP_FSAR_2.4S.5_SURGE." These files were validated using the system requirements shown in the 'Readme' worksheets of each XL file. Compatibility was not tested for another machine and the macro may not run correctly on a system with a different configuration. The macro may also not run correctly if the boundary or input conditions are changed.

For part (b), HEC-RAS project files corresponding with the probable maximum storm surge from part (a) are also provided in the enclosed CD. The project files are located in the subdirectory named "HECRAS_SURGE_Halff_Geometry." The HEC-RAS modeling was done with HEC-RAS Version 3.1.3 (Reference 1). The HEC-RAS computer code is a Bechtel standard application program, which has been independently validated by Bechtel. The cross-sectional geometry was the same as used in the Halff model (Reference 2).

References:

1. U.S. Army Corps of Engineers (USACE), 2005, "Hydrologic Engineering Center - River Analysis System, HEC-RAS Model", Version 3.1.3.

2. Halff Associates, Inc., "Flood Damage Evaluation Project", Volume I and Volume II-A through Volume II-D, prepared for the Lower Colorado River Authority and Fort Worth District Corps of Engineers, July 2002.

No COLA Revision is required as a result of this response.

Question 02.04.11-1

QUESTION:

Provide details to support the following statement in FSAR Section 2.4S.11.6, or delete it if it is not a relevant statement here: "The potential effects of all site-related proximity, seismic, and non-seismic information on the postulated worst-case low-flow scenario for the proposed plant site have been considered in establishing the design basis."

RESPONSE:

The third paragraph in FSAR Subsection 2.4S.11.6 that provides the statement "The potential effects of all site-related proximity, seismic, and non-seismic information on the postulated worst-case low-flow scenario for the proposed plant site have been considered in establishing the design basis" is not a relevant statement in this section.

Therefore, the third paragraph under FSAR Subsection 2.4S.11.6 will be removed as follows:

> ~~The potential effects of all site-related proximity, seismic, and non-seismic information on the postulated worst-case low-flow scenario for the proposed plant site have been considered in establishing the design basis.~~

Question 02.04.12-19

QUESTION:

In FSAR Section 2.4S.12.3.1, "Exposure Point and Pathway Evaluation", the applicant has placed an emphasis on the present day well being a "livestock" well. However, the Shallow Aquifer is an acknowledged source of "livestock and domestic" water. Provide a rationale for limiting discussion of Shallow Aquifer groundwater to "livestock" purposes.

RESPONSE:

The intent of FSAR Section 2.4S.12.3.1 is not to limit the discussion of the use of the Shallow Aquifer groundwater to "livestock" use. The well in question was cited in the discussion because it is the first well encountered in the path of the predominant groundwater flow direction in the Shallow Aquifer. Although this well was assumed to be for livestock use because most domestic wells in the area are installed in the Deep Aquifer – the pathway exposure analysis was not restricted to any particular use for the well.

The effluent concentration limits presented in FSAR Section 2.4S.13 for the well were not for indirect exposure through animals, but for the concentrations in the groundwater at this well location. As stated in FSAR Section 2.4S.13.1.4, effluent concentration limits from 10 CFR Part 20 were applied to exposure points considered in the analysis: "The analysis results indicate that an accidental liquid release of effluents in groundwater would not exceed 10 CFR 20 limits at the Lower Shallow Aquifer exposure points, which are the most likely groundwater exposure routes to be impacted by an accidental release."

It is unlikely that the Coastal Plain Groundwater Conservation District can or would require that domestic water supply wells be installed only in the Deep Aquifer. As a result, the third paragraph of Section 2.4S.12.3.1 of the FSAR will be revised to indicate that the well may be a source of either livestock or domestic water.

> The Upper Shallow Aquifer is the most likely hydrogeologic unit to be impacted by an accidental liquid effluent release onsite. Due to the shallow depth of this unit, a conservative release scenario would be a direct injection of liquid effluent into the Upper and Lower Shallow Aquifer. The Upper Shallow Aquifer has a flow direction toward the southeast, as discussed in Subsection 2.4S.12.2.2. Examination of Figure 2.4S.12-31 indicates that a potential Upper Shallow Aquifer groundwater discharge area would be the unnamed tributary, located to the east of the STP 1 & 2 Essential Cooling Pond (ECP), which flows into Kelly Lake, approximately 7300 ft from STP 3. A second possible discharge area for both the Upper and Lower Shallow Aquifer is at Well 2004120846, which is an 80 ft deep ~~livestock~~ well, located east of the site boundary approximately 9000 ft from STP 3. ~~This pathway assumes the well discharges to stock watering containers and that the groundwater is consumed by livestock, which would be an indirect human exposure pathway.~~ Although the actual use of this well is

believed to be as a livestock well; for the purpose of this exposure point and pathway analysis, it has been assumed that water from this well could also be used for human consumption. Information from Appendix 2.4S.12-A3 indicates this well is estimated to produce 200,000 gallons per year ~~or approximately 0.4 gpm~~. A third possible discharge area for both Shallow Aquifer units would be the Colorado River, approximately 17,800 ft from STP 3.

Question 02.04.13-2

QUESTION:

In FSAR Section 2.4S.13.1.2, Conceptual Model, the applicant describes the exposure as indirect and through animals (livestock). Is this germane to the analysis and results presented? In FSAR Section 2.4S.13.1.2 it is noted that the Shallow Aquifer is used for livestock watering and occasional domestic supply. During the period for which the license being sought, could the off-site well be a domestic well allowing direct exposure? Any changed or new information on the subsurface pathway in FSAR Section 2.4S.12 should be reflected in this and subsequent subsections of FSAR Section 2.4S.13.

RESPONSE:

The description of the conceptual model for exposure provided in FSAR Section 2.4S.13.1.2 had no impact on the exposure pathway analysis, but was stated to postulate the type of exposure expected from use of well 2004120846. This well, installed in the Shallow Aquifer, was assumed to be used for livestock watering in the analysis because most domestic wells in the area are installed in the Deep Aquifer. The effluent concentration limits used in the analysis discussed in FSAR Section 2.4S.13.1.3 do not pertain to indirect exposure through livestock but to direct exposure at the well.

As stated in FSAR Section 2.4S.12.3.1, well 2004120846 was used as a receptor for the Shallow Aquifer because it is the closest well in the area that lies in the prevalent direction of groundwater flow in the Shallow Aquifer – the aquifer most likely to be impacted by a release from the radwaste building. The stated expected concentrations identified in the groundwater at the location of this well, as presented in FSAR Section 2.4S.13.1.2, are independent of the use of the well. As a result, a scenario where a domestic well could be installed at this location or well 2004120846 could be converted from a livestock well to a domestic well would not affect the pathway analysis and conclusion.

No COLA revision is required as a result of this RAI response.

Question 02.04.13-5

QUESTION:

In FSAR Section 2.4S.13.1.3, Analysis of Accidental Releases to Groundwater, and FSAR Section 2.4S.13.4, Compliance with 10 CFR 20, are the effluent concentration limits identified and used in this analysis those for indirect exposure through animals (i.e., livestock) alone? Or, are the comparisons presented made to effluent concentration limits from 10 CFR Part 20, Appendix B, Table 2, Column 2? Please clarify.

RESPONSE:

The comparisons presented in FSAR Section 2.4S.13.1.3 are in reference to the effluent concentration limits from 10 CFR Part 20, Appendix B, Table 2, Column 2. The effluent concentrations limits identified are not for indirect exposure through animals only. As stated in FSAR Section 2.4S.13.1.4, effluent concentration limits from 10 CFR Part 20 were applied to exposure points considered in the analysis: "The analysis results indicate that an accidental liquid release of effluents in groundwater would not exceed 10 CFR 20 limits at the Lower Shallow Aquifer exposure points, which are the most likely groundwater exposure routes to be impacted by an accidental release." Identification of an exposure point as a livestock well did not limit the analysis to exposure to that particular use, but was merely made to identify a likely type of receptor in the area.

The following additions to FSAR Section 2.4S.13.1.2 will be made based on this response.

Seventh paragraph, first bullet:

- Pathway 1: Lower Shallow Aquifer – Flow from the STP 3 area that discharges to a Shallow aquifer livestock watering well (well number 2004120846) located offsite, to the southeast of STP 1 & 2. This pathway assumes that the well captures the effluent release and the well discharges to livestock watering troughs or the well water could be used for domestic or other human consumption.

Eight paragraph, first bullet:

- Pathway 1 terminates as discharge from a pumping well in the Shallow Aquifer. The well is reported to pump 200,000 gallons per year, or 0.4 gpm (Reference 2.4S.13-4). This well would be an indirect exposure pathway through animals (livestock) or direct exposure as a domestic well used for human consumption.

Question 02.04.13-7

QUESTION:

Provide a copy of reference 2.4S.13-7.

RESPONSE:

A copy of reference 2.4S.13-7 is attached.

Savannah River National Laboratory, STP Site Specific Kd Results Report, dated August 20, 2007, was submitted in a letter from MACTEC to Bechtel Power Corporation. Bechtel approved the Kd report and Savannah River National Laboratory (SRNL) signed and issued it final on September 20, 2007. The Kd report has been added to the STP COL Geotechnical Data Report (Revision 1), April 30, 2008, as Attachment H.

A change to the COLA will be made based upon this response. Reference 2.4S.13-7 will be revised to reflect it's inclusion as Attachment H of the STP COL Geotechnical Data Report (Revision 1).

2.4S.13 -7 ~~Savannah River National Laboratory, STP Site Specific Kd Results, Submitted by Correspondence in Letter dated August 31, 2007 from MACTEC to Bechtel Power Corporation.~~ MACTEC Engineering and Consulting, Inc., April 30, 2008 STP COL Geotechnical Data Report (Revision 1), Results of Subsurface Investigation and Laboratory Testing, South Texas Project Units 3 and 4, Matagorda, Texas, Attachment H - Kd Test Results, "Distribution Coefficients for the Combined Construction and Operation License (COL) Application at the South Texas Project Electric Generation Station", Kaplan, D. I., Savannah River National Laboratory.

Question 02.04.14-2

QUESTION:

Describe scenarios of hydrology-related events, if any, that may lead to water levels in the UHS basin dropping below 44.5 ft MSL and discuss the proposed protective measures that prevent these scenarios.

RESPONSE:

The UHS design described in Revision 1 of the STP 3 & 4 COLA is being modified. The following RAI response applies to the UHS design as currently described in COLA Revision 1. This response will be updated, if necessary, following completion of the UHS design modification, which will be presented in the next revision of the COLA.

There are no hydrology-related events that may lead directly to water levels in the UHS basin dropping below 44.5 ft mean seal level (MSL). Hydrology-related events considered for the site are described in Section 2.4S. The UHS is described in Subsection 9.2.5 as designed to withstand the most severe natural phenomena expected. Since the safety design basis of the UHS is intended to preclude its failure under natural phenomena, hydrology-related events are not directly postulated to result in the UHS dropping below 44.5 ft MSL.

An on-site well water system serves as the primary source for makeup water to the UHS. The Main Cooling Reservoir serves as a backup source. The makeup water system is classified as non safety related. Therefore, hydrology-related events such as severe storms, floods, etc., could affect the ability to provide makeup water to the UHS that may lead to water levels in the UHS reaching 44.5 ft MSL. Regardless of the scenario which may result in a loss of makeup capability, technical specifications require that a limiting condition for operation be entered when the level drops below 44.5 ft MSL. The technical specification requirements assure that 30 days minimum of inventory is available in the UHS for long-term cooling. The 30 day duration is adequate to restore the non safety-related makeup water system or to provide alternate means of makeup water to the UHS for any loss of makeup capability, including loss due to hydrology-related events such as severe storm, floods, etc, or loss of makeup capability for any other reason concurrent with the design basis accidents or design basis natural events considered in the UHS design. No further protective measures are necessary to maintain the plant in safe shutdown condition for 30 day duration.

No COLA revision is required as a result of this RAI response.

Question 02.05.01-5

QUESTION:

Section 2.5S.1.1.4.4.5.1 references Section 2.5S.1.1.4.3.3, which appears to actually reference 2.5S.1.1.4.4.3. Likewise, Section 2.5S.1.1.4.4.3 is not correct in cross-referencing Section 2.5S.1.1.4.4.5.1. In addition, Section 2.5S.1.1.4.4.5.2 directs the reader to Section 2.5S.1.1.4.3.4.3 for a review of the Balcones Fault and Luling Fault Zones. This reference is incorrect. Please review and correct the references.

RESPONSE:

A review of the document reveals that there is no Subsection 2.5S.1.1.4.3.3 and that the reference intended is Subsection 2.5S.1.1.4.4.3.

The Quaternary activity of the MEEG fault system is discussed in 2.5S.1.1.4.4.5.1, so the reference in Subsection 2.5S.1.1.4.4.3 (Page 2.5S.1-39) is correct. The sixth paragraph of Subsection 2.5S.1.1.4.4.5.1 will be changed as follows:

> As discussed in Subsection ~~2.5S.1.1.4.3.3~~2.5S.1.1.4.4.3, seismic reflection data suggest that the MEEG is rooted in the Jurassic Louann Salt at maximum depths of 3 to 4 mi (References 2.5S.1-119 and 2.5S.1-133). This suggests that observed late Quaternary displacement and contemporary creep across the MEEG may be driven by movement of salt at depth, indicating that the fault is not accommodating tectonic deformation and thus is not an independent source of moderate to large earthquakes. Presumably, this was the evaluation of the EPRI ESTs, which had access to the pre-1986 literature on the MEEG and did not specifically characterize it as a Quaternary tectonic fault and potentially capable structure. Notwithstanding, Ewing (Reference 2.5S.1-51) commented in a post-EPRI publication that "surface strata are displaced and seismicity suggests continuing deformation" on the MEEG.

The reference in Subsection 2.5S.1.1.4.4.5.2 to Section 2.5S.1.1.4.3.4.3 is incorrect and should be Subsection 2.5S.1.1.4.4.4.3 Tertiary Basement-Involved Faults. The first paragraph of Subsection 2.5S.1.1.4.4.5.2 will be changed as follows:

As discussed in Subsection ~~2.5S.1.1.4.3.4.3~~2.5S.1.1.4.4.4.3, the Balcones Fault and Luling Fault Zones comprise an approximately east-west-trending graben system located about 140 miles northwest of the site. The major displacements on the Balcones Fault are interpreted to have occurred in the late Oligocene-early Miocene (Reference 2.5S.1-129). In a post-EPRI publication, Collins et al. (Reference 2.5S.1-134) reported that downward tapering, wedge-shaped fractures filled with weathered colluvium have been observed along individual faults of the Balcones Zone. Collins et al. (Reference 2.5S.1-134) speculated that the fractures may have formed during surface-rupturing events on the associated faults and subsequently filled with colluvial material. Based on the degree of weathering and soil profile development in the colluvium, Collins et al. (Reference 2.5S.1-134) inferred that the deposits are Pleistocene in age. If the wedges of colluvium are filling fractures that formed during surface-rupturing events on

the Balcones Fault Zone, then the faults generated moderate to large earthquakes during the Quaternary. Collins et al. (Reference 2.5S.1-134) also noted, however, that strands of the Balcones Fault Zone are overlain by unfaulted Quaternary terrace deposits and that these relations suggest the fissure-fill deposits probably are not related to co-seismic faulting. Collins et al. (Reference 2.5S.1-134) concluded that detailed paleoseismic studies of the Balcones Fault Zone are needed to conclusively demonstrate activity or non-activity of the structure during the Quaternary.

Question 02.05.03-4

QUESTION:

Section 2.5S.3 contains numerous references back to Section 2.5S.1 that are incorrect. Please review and correct these references

RESPONSE:

The references in Section 2.5S.3 to subsections in Section 2.5S.1 are incorrect.

The second paragraph of Subsection 2.5S.3.1.2 will be changed as follows:

> As discussed in Subsection ~~2.5S.1.1.4.1.3~~2.5S.1.1.4.4.5.4, evidence for Quaternary activity in the form of surface deformation has been documented on some growth faults in the Texas Coastal Plain. As noted by Wheeler (Reference 2.5S.3-6):

The fifth paragraph of Subsection 2.5S.3.1.2 will be changed as follows:

> The assessment of the U.S. Geological Survey (Reference 2.5S.3-6) is, consistent with the data in Subsection 2.5.1 of the STP 1 & 2 UFSAR (Reference 2.5S.3-1) and studies published since the EPRI study (Reference 2.5S.3-3) (see discussion in Subsection ~~2.5S.1.1.4.3.5.3~~2.5S.1.1.4.4.5.4), that growth faults are confined to the Coastal Plain section and do not extend into the crystalline basement. The assessment of the U.S. Geological Survey (Reference 2.5S.3-6) that growth faults will not generate significant seismic ruptures also is consistent with the conclusion in Subsection 2.5.1 of the STP 1 & 2 UFSAR (Reference 2.5S.3-1) that the sediments involved in growth faulting do not have sufficient elastic strength to store strain energy that can be released in moderate to large earthquakes.

The sixth paragraph of Subsection 2.5S.3.1.2 will be changed as follows:

> Since the analyses described in the STP 1 & 2 UFSAR (Reference 2.5S.3-1), additional analysis and mapping of the subsurface geology in the site vicinity has been published to document the locations of growth faults. This mapping is tabulated and described in Subsection ~~2.5S.1.2.4.1.2.2.1~~2.5S.1.2.4.2.2.2. This mapping supports the analysis and conclusions of the UFSAR regarding the locations of growth faults in the site area, and it specifically indicates that no previously unknown or undocumented growth faults have been identified in the site area.

The first paragraph of Subsection 2.5S.3.2.1 will be changed as follows:

> As shown on Figure 2.5S.1-27, no bedrock faults have been mapped within the STP 3 & 4 site area (Subsection ~~2.5S.1.2.4.1.1~~2.5S.1.2.4.1).

The first paragraph of Subsection 2.5S.3.2.2.1 will be changed as follows:

> As discussed in Subsection ~~2.5S.1.2.4.1.2.1~~2.5S.1.2.4.2.1, Subsection 2.5.1.2.5.3 of the STP 1 & 2 UFSAR (Reference 2.5S.3-1) documents the presence of 10 growth faults within the site area. These faults are confined to the Mesozoic and Cenozoic Gulf Coastal Plain stratigraphic section and do not extend into the underlying crystalline basement. Subsection 2.5.1.2.5.3 of the STP 1 & 2 UFSAR presents seismic reflection and borehole data that demonstrate 8 of the 10 growth faults in the site area are buried by 5000 ft. or more of undisturbed sediments that are Miocene in age or younger, indicating that there has been no movement on these 8 faults in the past 5 million years or longer. Two of these growth faults ("A" and "I"; Figure 2.5S.1-43) exhibit evidence for deformation younger than Miocene and can be traced on seismic reflection profiles to within 800 ft. to 1000 ft. or less of the ground surface. The closest approach of growth faults "A" and "I" to the STP site area is approximately 3.0 miles and 3.8 miles, respectively. Subsection 2.5.1.2.5.3 of the STP 1 & 2 UFSAR notes that this depth range is the effective limit of resolution of the seismic reflection data, and thus the reflection data can not be used to assess whether the faults approach closer to the surface than 800 ft. to 1000 ft. Based on field reconnaissance and inspection of a shallow excavation along the western margin of the main cooling water reservoir, Subsection 2.5.1.2.5.3 of the STP 1 & 2 USFAR (Reference 2.5S.3-1) contains conclusions that there is no discrete displacement of the land surface, or of continuous stratigraphic contacts in the shallow subsurface, above the up-dip projections of growth faults "A" and "I."

The first paragraph of Subsection 2.5S.3.2.2.2 will be changed as follows:

> Subsection ~~2.5S.1.2.4.1.2.2~~2.5S.1.2.4.2.2.1 contains discussions of the compiled mapping and subsurface data that document the location and geometry of growth faults in the site area. These data support the mapping of growth faults in the site area documented in Subsection 2.5.1.2.5.3 of the STP 1 & 2 UFSAR (Reference 2.5S.3-1), and do not indicate the presence of any additional growth faults not recognized during the UFSAR investigations for STP 1 & 2. Specifically, there are no previously published data or new data that indicate the presence of growth faults whose surface projection approaches within the site.

The second paragraph of Subsection 2.5S.3.2.2.2 will be changed as follows:

> Subsection ~~2.5S.1.2.4.1.2.2~~2.5S.1.2.4.2.2.2 contains discussions of the compiled mapping and subsurface data that document the location and geometry of growth faults in the site area. These data support the mapping of growth faults in the site area documented in Subsection 2.5.1.2.5.3 of the STP 1 & 2 UFSAR (Reference 2.5S.3-1), and do not indicate the presence of any additional growth faults not recognized during the UFSAR investigations for STP 1 & 2. Specifically, there are no previously published data or new data that indicate the presence of growth faults whose surface projection approaches within the site.

The first paragraph of Subsection 2.5S.3.5 will be changed as follows:

There are no tectonic bedrock faults within the STP site area. Growth faults, which are confined to the Gulf Coastal Plain stratigraphic section and do not involve the basement, have been mapped in the site area and are associated with the Frio fault zone, which has been mapped for a minimum of 500 mi along trend in the Gulf Coastal Plain (see discussion in Subsection ~~2.5S.1.1.4.3.4.2~~2.5S.1.1.4.4.4.2). Although the Frio zone of growth faults is regionally extensive, it is designated a "Class B" feature by the U.S. Geological Survey (References 2.5S.3-5 and 2.5S.3-6) because it is unclear that growth faults are capable of producing significant seismic rupture and associated strong vibratory ground motion (see discussion in Subsection ~~2.5S.3.1.1.2~~2.5S.2.1.1.2). Subsection 2.5.2.4 of the STP 1 & 2 UFSAR (Reference 2.5S.3-1) concluded that growth faults are not capable of storing significant elastic strain energy to produce moderate to large earthquakes. Consequently, we conclude there is no correlation of geologic structures in the site area to regional, capable tectonic sources.

The first paragraph of Subsection 2.5S.3.8.2.1 will be changed as follows:

The potential for non-tectonic deformation at the STP site from movement on growth faults is negligible. As summarized in Subsection ~~2.5S.1.2.4.1.2.1~~2.5S.1.2.4.2.1, previous detailed studies of growth faults in Subsection 2.5.1.2.5.6 of the STP 1 & 2 UFSAR (Reference 2.5S.3-1) documented the absence of growth faults that project to the surface within the STP site. The UFSAR identified only two growth faults within the site area that deform sediments younger than late Miocene. Of these two structures, only growth fault "I" exhibits *prima facie* evidence for Quaternary activity, and the closest approach of the surface projection of growth fault "I" to the STP site is about 3.8 miles. Future activity on growth fault "I," if any, will not impact the STP 3 & 4 site.

Question 05.02.05-1

QUESTION:

5.2.5-1 STD DEP 7.3-12 describes modifications to the Technical Specification limits and alarm Setpoint for Reactor Coolant Pressure Boundary Leakage. The total leakage limit, averaged over the previous 24-hour period is changed from 95 L/min (25 gpm) to 114 L/min (30 gpm); the unidentified leakage limit is changed from 3.785 L/min (1 gpm) to 19 L/min (5 gpm); and a limit of unidentified leakage increase of 8 L/min (2 gpm) within the previous four hour period while in Mode 1 is added. Section 5.2.5.9 of the Tier 2 FSAR states that the changes in total leakage limit and unidentified leakage limit satisfies Position C.9 in Regulatory Guide (RG) 1.45. Please provide information to address how Regulatory Positions C.2 and C.5 in RG 1.45 are satisfied when evaluating this departure. Include this information in the FSAR and/or the departures report (as appropriate), and provide a markup in your response.

RESPONSE:

In NUREG-1503 "Final Safety Evaluation Report Related to the Certification of the Advanced Boiling Water Reactor Design," July 1994, at page 5-11, the NRC found that "The sensitivity and response time for all these primary detection systems is 3.79 L/min (1 gpm) or its equivalent in less than 1 hour, thus satisfying Positions C.2 and C.5 of RG 1.45, Revision 0." Departure STD DEP 7.3-12 did not make any changes to the sensitivity or response time for the primary detection systems. Consequently, NRC's finding that these systems satisfy Positions C.2 and C.5 of RG 1.45, Revision 0 remains valid and effective.

There are no changes to the COLA required by this response.

Question 05.02.05-2

QUESTION:

STD DEP 7.3-12 describes modifications to the alarm setpoints to support Technical specification limits for Reactor Coolant Pressure Boundary Leakage. Regulatory Guide 1.45 (Page 1.45-2) provides guidance on the "detector sensitivity," and states that "sumps and tanks used to collect unidentified leakage and air cooler condensate should be instrumented to alarm for increases of from 0.5 to 1.0 gpm." The sensitivity of 3.785 L/min (1 gpm) claimed by STP, is not demonstrated in the alarm set point, or in the TS limit, and is not explicitly shown being used by operators under any procedures. The staff believes that the alarm limit needs to be set as low as practicable to provide an early warning signal to alert operator taking actions. The staff finds that the proposed leakage alarm setpoint of 19 L/min (5 gpm) is not acceptable because it is not consistent with RG 1.45 and does not serve the intended function of alerting the operator to take actions before the TS limit is reached. Please provide and justify a revised alarm limit for the unidentified leakage. Include this information in the FSAR and/or the departures report (as appropriate), and provide a markup in your response.

RESPONSE:

The indicated sentence in Regulatory Guide (RG) 1.45 (Page 1.45-2) discusses typical industry practices and is not part of the Regulatory Position Section of the RG. The STP 3 & 4 RCS leak monitoring for drywell and secondary containment sumps design meets the regulatory elements of the RG as stated in the COLA. The STP 3 & 4 alarm setpoints are discussed in the COLA and in the discussion below.

Subsection 7.3 of the COLA states “The drain sump instrumentation has a sensitivity of detecting a reactor coolant leakage of 3.785 L/min within a 60 minute period. Alarm setpoints (nominal values) established at 114 L/min for floor and equipment drain sumps (total leakage) to 19 L/min for floor drain sump and 8 L/min for increased floor drain sump flow within the previous four hours.” STP 3 & 4 has added the 8 L/min alarm setpoint for increased floor drain sump flow to provide the operator with sufficient information and adequate early warning to ensure leakage does not violate the Technical Specification (TS) limits of 19 L/min and 114 L/min. TS 3.4.3 LCO Action B1 and B2 and Surveillance Requirement 3.4.3.1 and its associated Bases provide the supporting information for this TS limit. It should be noted that the STP 3 & 4 RCS leakage monitoring alarm setpoints are similar to the BWR-6 plants, which have been reviewed and approved by the NRC (Reference: Standard Technical Specifications General Electric Plants, BWR/6, NUREG-1434).

Alarm response procedures will be developed to specify operator actions in response to unidentified leakage rates greater than the alarm setpoint and less than the Technical Specification limit. These procedures will instruct the operators to use available monitoring of parameters such as drywell HCW sump level, drywell cooler drain flow, and airborne particulates to initiate trending while the condition is investigated. These procedures will be completed and available prior to fuel load.

The summary description of STD DEP 7.3-12 in COLA Part 7 will be revised to more clearly state the purpose for the addition of the "increase in unidentified leakage" parameter. The Departure Report of the COLA will be modified as shown below:

In lieu of providing plant-specific Leak-Before-Break analysis drywell leakage rate limits are provided as follows:

- Total leakage averaged over the previous 24-hour period is changed from 95 L/min to 114 L/min
- Unidentified leakage is changed from 3.785 L/min to 19 L/min
- Unidentified leakage increase of 8 L/min within the previous 4-hour period in Mode 1 is added

The 8 L/min increase in 4 hours is a plant computer based control room alarm that will provide an early warning to control room operators so they can take action well below the Technical Specification limit for unidentified leakage of 19 L/min. This alarm initiates on an increase in leakage above normal leakage values.

Question 05.02.05-3

QUESTION:

STD DEP 7.3-12 identifies the departure that changes the unidentified leakage limit from 3.785 L/min to 19 L/min (i.e. from 1 gpm to 5 gpm). The operating experience at Davis Besse indicated that prolonged low level unidentified leakage inside containment could cause material degradation such that it could potentially compromise the integrity of a system leading to the gross rupture of the reactor coolant pressure boundary. In order for the proposed departure to be found acceptable it would require proper compensatory measures (such as new operating procedures in response to leakage rates less than the limit set forth in the plant technical specifications). The applicant should establish a low leakage alarm setpoint that is set at 3.785 L/min (1 gpm) above normal leakage and below the TS limit of 19 L/min (5 gpm) to provide the operator sufficient time to take actions before the TS limit is reached. The applicant should also establish procedures that specify operator actions in response to leakage rates that are less than the limits set fourth in the TS. Please include this information in the FSAR and/or the departures report (as appropriate), and provide a markup in your response.

RESPONSE:

As discussed in the STPNOC response to NRC Question 05.02.05-2, STD DEP 7.3-12 adds a computer based control room alarm set at an increase in unidentified leakage of 8 L/min over the previous 4 hours. This alarm will provide adequate early warning to the operators so that they can take action well before the Technical Specification Limit of 19 L/min. It should be noted that the STP 3 & 4 RCS leakage monitoring alarm setpoints are similar to the BWR-6 operating plants, which have been reviewed and approved by the NRC.

Procedures will be established to specify operator diagnostic and corrective actions to address the alarm. These procedures will be available for NRC review prior to Fuel Load.

Subsection 5.2.5.2.1 will be revised as indicated on the following page:

STD DEP 7.3-12

(1) Drywell Floor Drain Sump Monitoring

The drywell floor drain sump collects unidentified leakage such as leakage from control rod drives, floor drains, valve flanges, closed cooling water for reactor services (e.g. , RIP motor cooling), condensate from the drywell atmospheric coolers , and any leakage not connected to the drywell equipment drain sump. The sump is equipped with two pumps and special instrumentation to measure sump fillup and pumpout times and provide continuous sump level rate of change monitoring with control room indication and alarm capabilities for excessive fill rate or pumpout frequency of the pumps. The drain sump instrumentation has a sensitivity of detecting reactor coolant leakage of 3.785 liter/ min within a 60 minute period. The alarm setpoint has an adjustable range up to 19 liters / min for the drywell floor drain sump. In order to provide early warning of RCS leakage to the operators, a computer based control room alarm is provided that requires operator action with an 8 L/min increase in unidentified leakage over four hours.

Question 05.02.05-4

QUESTION:

COL Information Item 5.1 under Section 5.2.6.1, "Conversion of Indications," in the FSAR addresses the requirement for the applicant to provide procedures and graphs to operations for converting the various indicators into a common leakage equivalent. The applicant's response to COL Information Item 5.1 indicates that surveillance procedures will direct the operator to convert the drywell leakage indications into a common leakage equivalent for unidentified and identified leakage to ensure that leakage requirements in the technical specifications (TS) are met. Furthermore, the applicant states, "The surveillance procedure measures levels in various leakage collection tanks over prescribed time frames and converts these levels into a leakage rate." The staff finds this methodology to be inadequate in the following areas:

(a) Only one of the four leakage detection instrumentation in the plant TS LCO 3.4.5 is addressed. It does not have "various indicators" specified in the COL Information Item. The applicant should specify how the rest of the various indications (i.e., drywell cooler condensate flow, airborne particulate and airborne gaseous radioactivity monitors) conversions to a leakage equivalent will be established and provided to operations as part of the important parameters to be included in the surveillance procedures for determining leakage rates.

(b) The purpose of the COL procedures is not just limited to ensuring the TS limits are met. It also provides operators leakage rates information to take actions in response to low level leakage. (c) The applicant should address when the procedures will be available. Please include this information in the FSAR and provide a markup in your response.

RESPONSE:

Surveillance procedures will be used by the operators to convert the various leakage measurements into a common leakage equivalent. These procedures will use drywell floor drain sump monitoring, airborne particulate, gaseous radioactivity, and drywell air cooler condensate to measure flow rate and will provide for operators to take actions before the Technical Specification limits are reached. The surveillance procedures will be completed and available prior to fuel load.

Section 5.2.6.1 will be revised as follows:

5.2.6.1 Conversion of Indications

The following site-specific supplement addresses COL License Information Item 5.1.

Surveillance procedures convert the drywell leakage indications into a common leakage equivalent for unidentified and identified leakage to ensure that leakage requirements in the

Technical Specifications are met. ~~The surveillance procedure measure levels in various leakage collection tanks over prescribed time frames and coverts these levels into a leakage rate.~~

There are four drywell leakage detection indications:

(1) Drywell floor drain sump monitoring system – The surveillance procedure measures the levels in various leakage collection tanks over prescribed time frames and converts these levels into a leakage rate.
(2) Airborne particulate channel of the drywell fission products monitoring system – The surveillance procedure converts the instantaneous detected radiation level into a leakage rate equivalent.
(3) Gaseous radioactivity channel of the drywell fission products monitoring system – The surveillance procedure converts the instantaneous detected radiation level into a leakage rate equivalent.
(4) Drywell air cooler condensate flow monitoring system – The surveillance procedure measures the flow rate in the drain line and converts this value to a leakage rate.

The surveillance procedures use the measured leakage rates from each of these monitors to determine a total unidentified leakage rate. The conversion of the information from the four leakage detection systems to a total leakage rate is accomplished by computerized programs. The drywell floor drain sump monitor, airborne particulates monitor, and drywell air cooler condensate flow monitor are capable of detecting leakage rates as low as 3.785 liters/min. The procedures include direction to the operators on actions to be taken before the TS limit is reached.

Question 09.01.04-1

QUESTION:

RAI-SRP 9.1.4-SBPB-02 Section 9.1.4.2.7.2, "Auxiliary Platform," of the ABWR DCD describes a maintenance platform at the reactor flange surface for in-vessel inspection and internals servicing. This section also provides details on the construction and installation of the platform. The STP Combined License Application (COLA) Section 9.1.4.2.7.2, "Auxiliary Platform," describes a work platform used to support maintenance activities during a refueling outage. The platform construction and function changed significantly from the information provided in the ABWR DCD. In accordance with SRP 9.1.4, "Light Load Handling System (Related to Refueling)," Section III.1, the reviewer verifies "The SAR information for light load handling equipment, including storage areas, is reviewed to determine whether a seismic event could cause damage to spent fuel or essential equipment. Equipment necessary to preclude inadvertent criticality should be designed consistently with Regulatory Guide (RG) 1.29 Position C.1. Equipment failure of which could damage stored fuel or other equipment essential for plant safety should be designed consistently with RG 1.29 Position C.2." Meeting this RG and applicable position supports compliance with GDC 2. The applicant should provide their evaluation of why this redesign did not require prior NRC approval by addressing the eight conditions of 10 CFR 52, Appendix A, Section VIII.B.5.

RESPONSE:

The description of Auxiliary Platform will be restored to the ABWR DCD description in the next COLA revision. FSAR Section 9.1.4.2.7.2 will be revised as follows:

9.1.4.2.7.2 Auxiliary Platform

~~*The auxiliary platform provides a reactor flange level working surface for in-vessel inspection and reactor internals servicing, and permits servicing access for the full vessel diameter. Typical operations to be performed are inservice inspections. No hoisting equipment is provided with this platform, as this function can be performed from the refueling machine. The platform operates on tracks at the reactor vessel flange level and is lowered into position by the reactor building crane using the dryer/separator strongback. The platform weighs approximately 17.79 kN and features 1.5m wide work areas and motorized travel. The platform power is supplied by a cable from the refueling floor elevation.*~~ ~~The 360 degree Auxiliary Work Platform is a temporary service platform designed to support multiple work scopes during plant refueling and maintenance outages, including in-vessel servicing, inspections, and modifications. The platform allows servicing personnel to perform parallel work scopes inside the reactor vessel.~~

~~The platform is a modular steel truss structure installed over the reactor vessel cavity and supported by structural feet sitting on the cavity ledge. The platform features a centralized access opening that provides access to the reactor vessel internal components. The auxiliary platform features a submerged personnel working area that allows workers to perform invessel activities~~

~~while the refueling machine travels overhead. The refueling mast travels through an access slot in the platform structure aligned with the fuel transfer canal.~~

The auxiliary platform provides a reactor flange level working surface for in-vessel inspection and reactor internals servicing, and permits servicing access for the full vessel diameter. Typical operations to be performed are inservice inspections. No hoisting equipment is provided with this platform, as this function can be performed from the refueling machine. The platform operates on tracks at the reactor vessel flange level and is lowered into position by the reactor building crane using the dryer/separator strongback. The platform weighs approximately 17.79 kN and features 1.5m wide work areas and motorized travel. The platform power is supplied by a cable from the refueling floor elevation.

Question 09.01.04-2

QUESTION:

RAI-SRP 9.1.4-SBPB-03: The STP COLA incorporated by reference Tier 1, Section 2.5.5, "Refueling Equipment," of the ABWR DCD, which stated that the auxiliary platform provided for servicing operations from the vessel flange level. Tier 2, Section 9.1.4.2.7.2, "Auxiliary Platform," of the STP COLA states that the auxiliary platform sits on the cavity ledge, which is inconsistent with the information provided in Section 2.5.5 of Tier 1 of the DCD. Also, Tier 1, Section 2.5.5, "Refueling Equipment," of the ABWR DCD, which is incorporated by reference in the STP COLA, describes the refueling machine as a gantry crane. Tier 2 Section 9.1.4.2.7.1, "Refueling Machine" changed the description of the refueling machine to "similar to a gantry style crane." Thus, there are conflicts between Tier 1 and Tier 2 information. 10 CFR 52, Appendix A, "Design Certification Rule for the U.S. Advanced Boiling Water Reactor" Section II. D. defines Tier 1 information, among other descriptive features, as being derived from Tier 2 information. Please provide clarifying information to reconcile the differences.

RESPONSE:

1. The description of Auxiliary Platform will be restored to the ABWR DCD description in the next COLA revision. FSAR Section 9.1.4.2.7.2 will be revised as shown in the response to RAI 09.01.04-1.
2. The refueling machine is a gantry crane.

FSAR Section 9.1.4.2.7.1 will be revised as follows:

9.1.4.2.7.1 Refueling Machine

The refueling machine~~,~~ that is ~~similar to~~ a gantry ~~style~~ crane, ~~which~~ which is used to transport fuel and reactor components to and from pool storage and the reactor vessel. The machine spans the spent fuel pool on ~~bedded~~ ~~embedded~~ bedded tracks in the refueling floor. A telescoping mast and grapple suspended from a trolley system is used to lift and orient fuel bundles for placement in the core or storage rack. Control of the machine is from an operator station on the refueling ~~floor~~ machine, or in-part from the remote operation panel in the refueling machine remote control room.

Question 09.01.04-3

QUESTION:

RAI-SRP 9.1.4-SBPB-04 Table 9.1-2, "Fuel Servicing Equipment," of the STP COLA changed the safety classification of the refueling machine from Safety Class 2 to non safety-related from the DCD. This same table invokes the quality elements of 10 CFR 50, Appendix B, commensurate with the importance of the requirement function. Section 1.4.4.1, "Inspection," states that "refueling and servicing equipment is subject to the strict controls of quality assurance, incorporating the requirements of 10 CFR 50 Appendix B" with the refueling machine having additional QA verification of compliance to drawing requirements. Table 3.2-1, "Classification Summary," of the ABWR DCD, which was incorporated by reference in the STP COLA, identifies the refueling machine as non safety-related with note (bb). Note (bb) states that "All quality assurance requirements shall be applied to ensure that the design, construction, and testing requirements are met." However, NUREG-0554, "Single Failure Proof Cranes," specifies additional quality assurance elements. Section 9.1.4.2.7.1, "Refueling Equipment," classifies the Refueling Machine as Seismic Class I and meets the requirements of NUREG-0554. NUREG-0544, Section 10, "Quality Assurance," describes the quality assurance program needed to comply with the NUREG-0554. The refueling machine is the only single proof machine listed in Table 9.1-2, "Fuel Servicing Equipment," of the STP COLA. Yet it's quality assurance requirements are not distinguished from the other components listed in the table. The applicant should clarify and identify the quality assurance requirements for the refueling machine ensuring that the interpretive requirements stated in Table 9.1-2 of the STP COLA are restated and in compliance with NUREG-0554 Section 10. Table 3.2-1 should also be in compliance with NUREG-0554.

RESPONSE:

The Quality Assurance Requirements for the Refueling Machine of "E = Elements of 10 CFR 50 Appendix B are generally applied, commensurate with the importance of the requirement function" were consistently specified in approved DCD Table 9.1-2, "Fuel Servicing Equipment," and Table 3.2-1,"Classification Summary," (Principle Component F5) and were not revised in the FSAR.

The application of quality requirements for the refueling machine is distinguished from other equipment in Table 9.1-2 by its function as a single-failure proof crane designed to meet the requirements of NUREG-0554, "Single-Failure-Proof Cranes for Nuclear Power Plants," as described in DCD (FSAR) section 9.1.4.4.1 "Inspection" and in Table 9.1-10, "Single-Failure-Proof Cranes."

STPNOC believes that the current level of detail in the FSAR is sufficient to ensure that quality requirements applied to the refueling machine are consistent with its single failure proof design features. These quality requirements would include for example: (1) design and procurement document control; (2) instructions, procedures, and drawings; (3) control of purchased material, equipment, and services; (4) inspection; (5) testing and test control; (6) non-conforming items; (7) corrective action; and (8) records.

No COLA revision is required as a result of this RAI response.

Question 09.01.04-4

QUESTION:

RAI-SRP 9.1.4-SBPB-05 10 CFR 52.47(b)(1) requires that COLAs contain the proposed inspections, tests, analyses, and acceptance criteria that are necessary and sufficient to provide reasonable assurance that, if the inspections, tests, and analyses are performed and the acceptance criteria met, a facility that incorporates the design certification has been constructed and will be operated in conformity with the design certification, the provisions of the Act, and the Commission's rules and regulations. COL Information Item 9.4 instructs the applicant to provide a confirmatory load drop analysis for the Spent Fuel Racks. The applicant has stated that this is dependent on vendor specific information and will be provided as an FSAR amendment and is captured in COM 9.1-2.
Please explain how capturing the COL Information Item 9.4 in COM 9.1-2 meets the requirements of 10 CFR 52.47(b) (1).

RESPONSE:

10 CFR 50.47 (b) (1) applies to a Design Certification applicant. As evidenced by Appendix A to Part 52, 10 CFR 50.47 (b) (1) has been satisfied for the ABWR.

No COLA revision is required as a result of this RAI response.

Question 09.01.04-5

QUESTION:

STD DEP 9.1-1, "Update of Fuel Storage and Handling Equipment," states that the vacuum sipper was deleted. Figure 9.1-7, "Fuel Pool Vacuum Sipper", was deleted. Yet Section 9.1.4.2.3.5, "Fuel Pool Vacuum Sipper", was modified and remains part of the application. Please explain the apparent inconsistency.

RESPONSE:

1. The Fuel Assembly Sampler will be used instead of the Fuel Pool Vacuum Sipper. Therefore, FSAR Sections 9.1.4.2.3.5, 9.1.4.2.7.3, and 9.1.4.2.10.2.3.4 will be revised and Figure 9.1-11 restored.

FSAR subsection 9.1.4.2.3.5 will no longer be used and is revised as follows:

9.1.4.2.3.5 ~~Fuel Pool Vacuum Sipper~~ Not Used
~~*The fuel pool vacuum sipper (Figure 9.1-7) provides a*~~ is one ~~*means of identifying fuel suspected of having cladding failures. The fuel pool vacuum sipper consists of a fuel isolation container, fluid console, monitoring console with program controller and beta detector and the interconnecting tubing and cables.*~~ ~~The fuel isolation containers are placed in the equipment storage racks.~~ ~~*The suspected fuel assembly is placed in the isolation container. A partial vacuum is established in the gas volume above the fuel assembly. The fission product gas leakage is sensed by the beta detector and monitoring console.*~~

FSAR subsection 9.1.4.2.7.3 will be revised to restore the approved DCD text (italics) with appropriate changes [deletions (strikethroughs) and additions (regular font, underlined text)] as follows:

9.1.4.2.7.3 *Fuel Assembly Sampler* ~~Not Used~~
The fuel assembly sampler ~~*(Figure 9.1-9)*~~ *provides a means of obtaining a water sample for radiochemical analysis from fuel bundles while installed in the core. The fuel assembly sampler consists of a sampling* ~~*station*~~ head, ~~*two*~~ a *sampling chamber*~~*s*~~ *and interconnecting tubing. The sampling* head consists of two sipping tubes. ~~*chambers are lowered over four adjacent assemblies and samples are obtained of the water in the fuel channels.*~~ The refueling machine grapple with the sampling head is lowered over the fuel in the core to obtain the water samples.

FSAR subsection 9.1.4.2.10.2.3.4 will be revised to restore the approved DCD text (italics) with appropriate changes [deletions (strikethroughs) and additions (regular font, underlined text)] as follows:

9.1.4.2.10.2.3.4 ***Fuel Assembly Sampling*** **~~Not Used~~**

During reactor operation, the core offgas radiation level is monitored. If a rise in offgas activity has been noted, the reactor core may be sampled during shutdown to locate any leaking fuel assemblies. The sipping tube is attached on the refueling machine grapple, water inside the fuel channel is sipped and the fission product gas leakage is sensed by the detector. ~~*The fuel sample isolates up to a four-bundle array in the core. This stops water circulation through the bundles and allows fission products to concentrate if a bundle is defective. After 10 minutes, a water sample is taken for fission product analysis.*~~ *If a defective bundle is found, it is transferred to the spent fuel pool and stored in a special defective fuel storage container to minimize background activity in the spent fuel pool.*

Question 11.04-1

QUESTION:

STD DEP 11.4-1, "Radioactive Solid Waste Update," completely replaces the approved solid waste management system design as approved in the ABWR DCD. The change describes including deleting equipment, adding tanks, and using modular equipment. Section 3 of the Departures Report indicates that this departure has been evaluated and determined to comply with the requirements of 10 CFR 52, Appendix A, Section VIII.B.5. However, because the DCD was completely replaced and the system redesigned, the staff has not been able to find enough information to determine the acceptability of the applicant's evaluation per the requirements in 10 CFR 52, Appendix A, Section VIII.B.5. Provide this evaluation to confirm that the requirements in 10 CFR 52, Appendix A, Section VIII.B.5 have been satisfied.

RESPONSE:

The 10 CFR 52, Appendix A, Section VIII.B.5 screening evaluations were re-created as part of the COLA Rev 2 effort since the previous documents were not available. The evaluation for DEP 11.4-1 is attached.

No COLA revision is required as a result of this response.

10 CFR 52 Review of Proposed COLA Changes (1/3)

U7-P-L02-0001/REV 0	10 CFR 52 Review of Proposed COLA Changes	Form 1		page 1 of 3	
Candidate Change Number 2007011		COLA Part 2 (FSAR) Section 11.4			
1.	Does the proposed change affect Tier 1 information, Tier 2* information, Technical Specifications, bases for the Technical Specifications, or operational requirements?	YES	□	NO	■
If the answer is "YES", the screen is complete and the change must have prior approval by the NRC. If the answer is "NO", go to Question 2.					
2.	Does the change consist ONLY of format modifications or rewording for clarification and/or editorial correction with no change to meaning or intent?	YES	□	NO	■
If the answer is "YES", the screen is complete and the change may proceed. If the answer is "NO", go to Question 3.					
3.	Does the proposed change affect ONLY information that is not within the scope of the ABWR DCD?	YES	□	NO	■
If the answer is "YES", the screen is complete and the change may proceed. If the answer is "NO", continue with the rest of the screening questions below.					
4.	Could the Proposed change result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the plant-specific DCD?	YES	□	NO	■
5.	Could the proposed change result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component (SSC) important to safety previously evaluated in the plant-specific DCD?	YES	□	NO	■
6.	Could the proposed change result in more than a minimal increase in the consequences of an accident previously evaluated in the plant-specific DCD?	YES	□	NO	■
7.	Could the proposed change result in more than a minimal increase in the consequences of a malfunction of an SSC important to safety previously evaluated in the plant-specific DCD?	YES	□	NO	■
8.	Could the proposed change create a possibility for an accident of a different type than any evaluated previously in the plant-specific DCD?	YES	□	NO	■
9.	Could the proposed change create a possibility for a malfunction of an SSC important to safety with a different result than any evaluated previously in the plant-specific DCD?	YES	□	NO	■
10.	Could the proposed change result in a design basis limit for a fission product barrier as described in the plant-specific DCD being exceeded or altered?	YES	□	NO	■
11.	Could the proposed change result in a departure from a method of evaluation described in the plant-specific DCD used in establishing the design bases or in the safety analyses?	YES	□	NO	■
12.	Could there be a substantial increase in the probability of an ex-vessel severe accident such that a particular ex-vessel severe accident previously reviewed and determined to be not credible could become credible?	YES	□	NO	■
13.	Could there be a substantial increase in the consequences to the public of particular ex-vessel severe accident previously reviewed?	YES	□	NO	■
If the answer to any of Questions 4 through 13 is "YES," a detailed explanation must be provided on the next page.					
PREPARER (SIGN/PRINT)		DATE			
Robert A Nelson / ROBERT A. NELSON		06/25/08			
INDEPENDENT REVIEWR (SIGN/PRINT)		DATE			
William J Johnson / William J Johnson		06/25/08			

THIS FORM, WHEN COMPLETED, SHALL BE RETAINED AS PART OF THE CHANGE VALIDATION PACKAGE.

10 CFR 52 Review of Proposed COLA Changes (2/3)

U7-P-L02-0001/REV 0	10 CFR 52 Review of Proposed COLA Changes	Form 1		page 2 of 3	
Question number 4-13 for which the answer is "Yes"					
Conclusion: Is prior NRC approval required?		YES	□	NO	■

Detailed Explanation:

This departure (1) changes the Solid Waste Management System from a system using permanent volume reduction and solidification equipment to a mobile dewatering and packaging system and (2) adds additional tanks and pumps.

Evaluation Summary:

1. A standard search of the STP 3 & 4 COLA, DCD, and Technical Specifications and bases was performed for keywords "solid radwaste" and "SWMS." The Tier 1, Tier 2*, technical specifications and bases were reviewed and were found not to be impacted by this departure. Tier 2 Sections 11.4 and 12.2 were found to be impacted by this departure.

2. This departure is a Tier 2 design change and therefore is more than editorial.

3. This departure affects Tier 2 of the DCD.

4. No fundamentally new processes or equipment are introduced by the changes to the Solid Waste Management System (SWMS) and the complexity of the system is reduced (i.e., the incinerator, the dryer, the compactor, and the radwaste solidification system are removed). The limiting accident for the Radwaste Building is the failure of the Low Conductivity Waste (LCW) collector tank and the subsequent airborne release which is described in Section 15.7.3 of the DCD. The capacity of the SWMS tanks is not increased, therefore, the LWC Collector Tank failure remains the limiting accident. Therefore, the proposed change does not result in more than a minimal increase in the frequency of the limiting accident previously evaluated in the plant-specific DCD.

5. No fundamentally different processes or equipment are introduced by the changes to the SWMS. Complex components, which are more prone to malfunction than other components in the SWMS (i.e., incinerator, the dryer, the compactor, and the radwaste solidification system), are removed as part of these changes. Other changes use components that are comparable to those described in the plant-specific DCD. Therefore, the proposed change does not result in more than a minimal increase in the occurrence of a malfunction of a structure, system, or component (SSC) important to safety previously evaluated in the plant-specific DCD.

6. The description of the limiting accident associated with the Radwaste Building, which is described in DCD Section 15.7.3, states that the Radwaste Building is a Seismic Category I Structure. As part of these changes, the Radwaste Building structure will be designed in accordance with the seismic requirements of Regulatory Guide 1.143 and will not be Seismic Category I. However, the tank cubicles are lined with steel to a height capable of retaining the contents of the tank. Therefore, postulated release to the groundwater is not considered credible. Therefore, the proposed change does not result in more than a minimal increase in the consequences of the limiting accident previously evaluated in the plant-specific DCD.

10 CFR 52 Review of Proposed COLA Changes (3/3)

U7-P-L02-0001/REV 0	10 CFR 52 Review of Proposed COLA Changes	Form 1	page 3 of 3
Question number 4-13 for which the answer is "Yes"			

7. No fundamentally different processes or equipment are being introduced by the changes to the SWMS. Components, which contain concentrated radionuclides at high temperatures (i.e., the incinerator, the Concentrated Waste Tank, and the dryer), are removed as part of these changes. Other changes use components that are comparable to the design described in the plant-specific DCD. Removal of these systems reduces the potential consequences of a malfunction by eliminating the potential for malfunctions. Therefore, the proposed change does not result in more than a minimal increase in the consequences of the malfunction of a SSC important to safety.

8. No fundamentally new processes or equipment are being introduced by the changes to the SWMS. Therefore, the proposed change does not create the possibility for an accident of a different type than evaluated previously in the plant-specific DCD.

9. No fundamentally new processes or equipment are being introduced by the changes to the SWMS. Therefore, the proposed changes do not create the possibility for a malfunction of an SSC important to safety with a different result than evaluated previously in the plant-specific DCD

10. The changes to the SWMS do not involve any interaction with the fuel, reactor system boundary, or the containment boundary. Therefore, the proposed change does not affect the fission product barrier as described in the plant-specific DCD.

11. The SWMS design basis waste quantities and characteristics are similar to those described in the DCD. The limiting safety analysis for the Radwaste Building is described in Section 15.7.3 of the DCD and the method of performing the analysis does not change. Therefore, the proposed change does not result in a departure from the method of evaluation described in the plant-specific DCD used in establishing the design basis or in safety analysis.

12. The changes to the SWMS do not involve any interaction with fuel, reactor system boundary, or the containment structure or interact directly with systems associated with ex-vessel severe accidents. Therefore, there is no substantial increase in the probability of an ex-vessel severe accident such that a particular ex-vessel severe service accident previously reviewed and determined to be not credible could become credible.

13. The changes to the SWMS do not involve any interaction with fuel, reactor system boundary, or the containment structure or interact directly with systems associated with ex-vessel severe accidents or severe accident mitigation. Therefore, there is no substantial increase in the consequences to the public of a particular ex-vessel severe accident that was previously reviewed.

Question 11.04-2

QUESTION:

STP Section 13.4S "Operational Program Implementation," states that "Descriptions of these operational programs, consistent with the definition of "fully described" in the Staff Requirements Memorandum for SECY-05-0197, are provided in the FSAR sections noted in Table 13.4S-1." On Table 13.4S-1, the Process Control Program (PCP) references application Section 11.4 as the section where this program is "fully described." Please justify how the description contained in Section 11.4 is consistent with the definition of "fully described" or provide additional detail regarding the PCP.

RESPONSE:

Chapter 11, Subsections 11.4.3.1(2) and 11.4.3.1(3) of the FSAR state that the PCP utilized by Units 1 & 2 is provided with the COL application. The PCP governing procedure was provided as Attachment 8 to the COL application. This document is a site procedure that will apply to all operating Units on site, fully describing the Process Control Program. Therefore it will also be utilized for Units 3 & 4. The FSAR will be revised to clarify this as shown below:

11.4.3 Plant-Specific Solid Radwaste Information

(2) The wet waste solidification process and the spent resin and sludge dewatering process will result in products that comply with 10 CFR 61.56 for STP 3 & 4 as provided in Radioactive Waste Process Control Program (PCP). The site PCP utilized by Units 1 & 2 is provided with the COL application, and will be implemented by Units 3 & 4. The latest revision will be provided as per the schedule in Table 13.4S-1.

(3) Establishment and implementation of a process control program (PCP) for the dewatering processing of the spent resins and filter sludges for STP 3 & 4 is provided in Radioactive Waste Process Control Program (PCP). The site PCP utilized by Units 1 & 2 is provided with the COL application, and will be implemented by Units 3 & 4. The latest revision will be provided as per the schedule in Table 13.4S-1.